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ABSTRACT

This document gives an account of the research and development of educational projects for geography instruction. The book is divided into three parts: (1) the Hong Kong experiment, stretching from 1957 to 1964; (2) a search for theory and method to design educational geography information, spanning 1974 to 1984; and (3) exploring the construction of geographical knowledge products, from 1987 to 1990. Each part is divided into: an introduction and context; posing the problem; plan or organization of the project; the course or process of the project; conclusions and recommendations, and references. The document stresses the interrelatedness of the three periods of research toward increasing understanding of effective geography instruction. The study in the first part consisted of a comparative study of an original documentary film for public information and an adapted version with reference to its usefulness in geography teaching in formal education. The purpose was to discover whether a documentary film with typical geographical features could be made to serve geographical education so that the content would be understood. The experimenters concluded that the inclusion of maps would greatly increase the effectiveness of the films. The second part deals with a graduate level study of geography instruction for both traditional formal education, and for adult education, that would meet the demographic changes in society. The third part of the book describes individual studies focused on the design of geographical information for educational purposes. (DK)

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# Nederlandse Geografische Studies

123

B.S. van der Muller

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## PROLOGUE

Before you lies an account of research into knowledge products. Serving our society with knowledge products is a matter of great concern.

Reporting about research in general is full of pitfalls; this is particular true in the case of the humanities. Of all the difficulties language in its different aspects, might very well be one of the most significant.
The language barrier in the mother tongue may often lead the unwary writer to transmit a message other than the one intended; the more so is this the case when the writing is undertaken in a foreign language. Moreover, when it is the author's intention to make the report accessible to a public for which the language of publication is also a foreign language, then the difficulties are compounded.
The language in which the publication is written then functions as a bridge in that it spans linguistic gaps. World wide, the English language has an important communication function, which is indeed a great responsibility. The understanding of the content should be the central point, albeit at the cost of the idiomatic beauty of the English language.

From this point of view Prof. Dr. Norman J. Graves, of the University of London Institute of Education, undertook the corrections and the recommendations concerning the English language of the manuscript and joined me in thinking about the content. I am most grateful. The full responsibility for the content remains with the author.
May 'Serving the knowledge-based society : research on knowledge products' enjoy a wide use.

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## ON THE ORIGIN OF THE CONTINUITY OF THE RESEARCH CONCERNED

Continuity is vital for research, therefore, I thought it necessary to make some remarks as to its origin.

The research as accounted for and described in 'Serving the Knowledge-based Society, Research on Knowlegde Products' was undertaken on the basis of a commitment to questions concerning informing about geography for educational purposes in a broad sense (formal, non-formal, adult education and public information) and executed roughly between 1957 and 1990.
Where, when and why was my interest in questions about information born. It is not so easy to find the early beginning.

In the course of life a human being tends to incorporate ideas, thoughts, experiences, the positive as well as the negative. The process of mental growth happens to a person particularly through guidance by education and training. It is especially as a result of a person's intrinsic values that some events, important and less important, become stored more firmly in the memory than others.

As indicated, some explanation for the origin of the continuing interest in information transmission is needed, however, mentioning events will be avoided.
An essential part already of my childhood-education was the process of learning and trying to understand things told, heard, seen and read; ordering, attempting to draw conclusions, not taking things for granted and if necessary taking action. Thus, at an early age, in a quite natural way, feelings of responsibility for things and for the events taking place around me developed.
Unfortunately it was not always easy and often difficult to understand what was meant and thus wrong conclusions were drawn, which led to unfortunate consequences. Gradually it became clear to me that the misunderstandings took place at all levels and in all situations. What could be the cause? It seemed that one of the main reasons could be that not sufficient care was given to the quality of the information: its content and the content's expression. This was specially found when I was confronted with particular situations which contrasted with normal ones. Such was for example the case which I experienced as a pupil at a secondary night school. Of course a night school need not to be better than a day school, but for me the efficiency in teaching as to style and performance, reflecting the teacher's feeling of responsibility for the students, was an eye-opener and inspired confidence.
My interest in the quality of information (in the sense of data, processed data, and specialist knowledge) and its dissemination, has remained and indeed grown over the years. Many simple everyday experiences widened my perspective. And in searching for and reading relevant literature and in being active in the informative field in various respects I tried to broaden and deepen the special field of my interest.

As a secondary teacher in geography, standing in front of the class in the actual teaching/learning situation I looked for optimal ways to transmit subject matter. Several ways were tried out to teach aspects of geography which pupils experienced special difficulty in understanding. I hoped to be able to obtain significant differences in student learning, but in vain; the morass of variables in the normal teaching/learning situation made the task impossible.
Becoming aware of this I realized that the teacher as well as the pupil at least should have at his/her disposal eminently educational materials. Coming across many diverse geographical educational materials such as textbook, maps, and audiovisual materials, it was noticed that often their quality was not as high as it should be. This concerned the content, the expression of the content and the media realization. This notion was undoubtly generated by my concern and interest for the quality of information to process into knowledge.
Thus after 6 to 7 years when the moment was there to begin a Ph.D. research the choice of topic was the investigation of the informative facets of educational materials. In principle the HONG KONG experiment was born. Hence the preceding remarks on the origin of the continuity of the research.
Preceding the Ph.D. work, I had, thank to a grant from the Ford Foundation, during the fall of 1955, the opportunity to study at Penn. State University, University Park, PENN., some of the famous research projects of the Instructional Film Research Project executed between 1918-1950 (Hoban & van Ormer, 1951), and to participate, as a staff member, in the preparation of campus-bound television lectures.

The three research projects accounted for and described below viz.: (I) 'The HONG KONG experiment', (II) 'In search of theory and method to design geographical information' and (III) 'Exploring the construction of geographical knowledge products', and their follow up brought me gradually closer to the essential features of the criteria for quality in the design of geographical knowledge products for formal, non-formal, adult education and public information.

**References**

HOBAN, C.F. and ORMER, E.G. VAN (1951), Instructional Film Research, 1918-1950. Technical Report No. SDC 269-7-19, Special Devices Centre, New York: Port Washington, L.I.

The activities in the informative field affected among other things: the design of learning materials (slide series, filmstrips etc.) in cooperation with the Netherlands Institute for Audiovisual Media, The Hague, the Institute for Visual Education, Amsterdam and Dutch Radio (NCRV), Hilversum; the reviewing of learning materials for Geografisch Tijdschrift (Geographical Review) and the participation as a teacher on film courses (Catholic Film Federation).

Of the different positive contacts and collaborations as to research only one example will be mentioned which may be of special importance for future research. This research, although it did not set a trend, did influence other work through its methods, in particular the use of a research group.

MULLER, HETTY S., DRIEL A.A.E. VAN, PETERS, J.M.L., SIJMONS, A.H. WIERINGEN, H. VAN (1958), Sociografie van de tweede wereld. Wat krijgt onze jeugd in de bioscoop te zien? Verslag van een onderzoek. (Human geography of the second world. What do young cinema-goers get to see? Report of a research study. Purmerend: J. Muusses. 82 p.

### *Brief review of the research*

'Human geography of the second world' is a feature film research study, executed in the years 1955 and 1956 and to be seen in respect of the vogue for content analysis as existed in the fifties. The project was undertaken on the request of the Institute for Film and Youth, the Hague, an Institute sponsored by the Foundation for Mental Health, Leiden.
The research group consisted of five persons, professionally chaired by Dr. J.M.L. Peters (from 1967 on professor for audiovisual communication, at Leuven University, Leuven, Belgium).
The members of the group analyzed the content of 60 feature films, the type of cinema programmes the working class youth went on in the mid-fifties (girls' preferences: show, romantic; boys' preferences: adventure, war westerns). At that time, visits to the cinema were still popular. Together, the members watched each Wednesday evening, in a cinema in The Hague, one of the films chosen for the study. The content analysis was done using a special constructed scheme, each member having her/his own field of attention. Short notes were made during the film show. The first evening-performance was arranged so that ample time was left to discuss the application of the analytical scheme.
Also the final report was written in co-operation and published in 1958. A design formula was found for each of the film categories notwithstanding the attempt to disguise this with well developed filmic glitter.

# SERVING THE KNOWLEDGE-BASED SOCIETY : RESEARCH ON KNOWLEDGE PRODUCTS

## Part I : THE HONG KONG EXPERIMENT (1957-1964)

### 1 Introduction and context

The HONG KONG experiment, aimed at refining the information function of a documentary film, was conducted in 1959 and published in 1964. It was the essential part of the Ph.D. research of the author.

As was usual in the 1950s, the research was small scale, fully self-managed, making use of essay type questions whose analysis was undertaken without the help of a computer, with actions, experiments and findings, all written up in a fully documented publication. And perhaps this way of proceeding was the optimum one to realize an experiment involving personal data processing, so sensitive by nature; many, many times the papers with the answers of the testees, the source material, passed through the researcher's hands and by that, it was felt, gained in value, a procedure nowadays, of course, carried out with the help of a computer program.

Anyhow, for me as a researcher, the HONG KONG experiment continued to remain over the years an, often consulted, storehouse of knowledge, especially is this the case when watching educational and public information programmes on television, video and computer screens.

The HONG KONG experiment is fully described in 'Leren met beelden' (Learning with images), Groningen, J.B. Wolters, 1964, pp. 138-262.
In the following summary the reader is made familiar with the HONG KONG experiment.

### 2 Posing the problem. The 'what', 'why' and 'how'

**The 'what'**
The experiment under consideration consisted in a comparative study of an original documentary film for public information and an adapted version with reference to its usefulness in geography teaching in formal education. The purpose was to find out whether with relatively scanty means a documentary film with typical geographical features could be made to serve geographical education so that understanding of the content was obtained.

**The 'why'**
The reason for the experiment was the existence of a shortage of audiovisual material made for geographical education, especially films (in the fifties video material being still unknown).
But many were the documentary films made available by information services of the public relations departments of commercial firms, embassies, governmental and

semi-governmental services. The film libraries of all those institutions were well equipped with documentaries of which, in principle, quite a number could serve geographical education (see for examples in educational usage, Verduin-Muller, 1964, pp. 95-107).

In principle indeed, because unfortunately the manifold fine documentary film images often missed a geographical setting, thus the films were reduced to a collection of pictures and by that lost their potential use for geographical education. So, in conclusion, it seemed from an educational point of view legitimate to suppose a possible increase of the geographical information value when making conceptual adaptations. It is with this view in mind that the idea for a research project originated.

**The 'how'**

After a careful previewing of a number of films the documentary film HONG KONG was selected for an experiment. The film in black/white, was produced by Taurus Films, London, 1950, commissioned by the Central Office of Information, London. The selection was due to the following factors.

The HONG KONG film lasted 17 minutes, a convenient duration to include in a lesson; the spoken commentary was in Dutch. The British Crown Colony was (then) not featured in the mass media. Moreover the documentary HONG KONG was very typical of its sort, in that the geographical and filmic presentation of the essence and the related problems of the Crown Colony was mediocre. It was expected, anyhow hoped, that with relatively low costs the geographical shortcomings of the HONG KONG film could be improved sufficiently.

In order to do the experiment, the Information Officer of the British Library, The Hague, was kind enough to let me have a copy in English of the HONG KONG film. The conditions were: to return the documentary film in the same state as was made available to me and to hand in a copy of the research project after publication.

## 3 The plan of the experiment

This section briefly refers to the adaptations made to the HONG KONG film; to the formation of both the test groups: the experimental and the control group and to the test itself.

### 3.1 The adaptations

In the dissertation the consideration of and the motives for the adaptations as made and the adaptations themselves are precisely described, together with a full publication (as appendixes) of the basic script in English, of the text + descriptions of the film scenes, both of the experimental version in Dutch and the version in Dutch intended for public information, the so-called original version.

In this summary of the experiment the account of the adaptations, so crucial in scientific terms, must be restricted. The adaptations concerned the spoken commentary and the insertion of maps. First the commentary then the maps will be discussed.

* The commentary of the English copy, the experimental version, was replaced by a Dutch one and kept as close as possible to the public information copy in Dutch. In doing so some adaptations were made, the translation of the commentary was kept plain, complicated sentences were avoided, a clear connection between various points in the text pursued, concepts supposed unknown were shortly described and recapitulations were given. In the experimental version, the running commentary used by the original version was modified by breaking into it and inserting appropriate words and phrases.
  To clarify the relation between cause and effect, it was often sufficient to change or to add a few words. Also commentary and film scenes were brought closer together, four times in the experimental version the relationship between image and commentary was made explicit. The commentary as a whole became more aimed at the understanding of the information provided.

* Concerning the maps: three maps, two general overwiew maps and one specific map, were inserted at carefully selected places.
  On a map of the globe (scale 1:86 1/2 million) the location of HONG KONG on the other side of the world from Europe was indicated by an arrow; this global map together with the arrow-marked location (in a typical filmic way), formed the introduction of the film and and at the end of the film, the arrow pointed westwards from HONG KONG to the viewers' point of departure.
  The second map of a general character showed East Asia (scale 1:47 million); by arrows the location of HONG KONG between the trade centres Tokyo and Singapore was clarified.
  The third map, then, a situation map (scale 1:250 000) was specifically drawn for the experimental version, consequently the map could be given the necessary cartographic design. Together with a commentary, aimed at the geographical content of the documentary, the situation map indeed was very special. The map was inserted twice.

Much technical assistance was given by the Foundation Technical Film Centrum, Velp, The Netherlands.
The Dutch commentary of the experimental version, spoken by a geographer with a schooled voice, was tape-recorded and played synchronically during the presentation of the experimental version.

### 3.2 The test groups

In order to form two test groups, a control group to see the original version and experimental group, to see the adapted version, the pupils of three second-form classes of the 2nd HBS-A, a secondary school, in Amsterdam were divided into two groups of 34 persons, each group consisted of 20 boys and 14 girls, the medium age at the time of the experiment (June 18th 1959) was 14 years and 6 months. All pupils were taught geography by myself.

Because no reliable tests were then available, other data were collected. To sum up, these were: the mark for geography, latest obtained, Easter '59; the relation of the geography mark with the other school results, Easter '59; male/female proportion and age; a pre-test on the possible familiarity with the film; written results of a preceding documentary film research project on the HOOVERDAM. (See for the HOOVERDAM research, Verduin- Muller, 1964, pp. 115-137.)

### 3.3 The questionnaire

The pupils' retention of the information in both the documentaries, the original and the experimental film, was measured by a questionnaire. The questions could be classified into three categories: one about the data that were identical in the two versions, one about data that had been formulated more clearly in the commentary of the adapted version and one about data which received more emphasis in the images and the added text of the adapted version. There were altogether 16 questions, but four of them were subdivided into three/four, subquestions. This was done to trace how far certain notions could be derived from different parts of the film.

The questioning is not strictly legitimate because the person who sees a film, experiences it as a totality. There is a constant interweaving of and interaction between image and commentary both within one separate scene and between different scenes. It is possible, however, to indicate certain passages in a film in which image and commentary state the data of the contents of the film explicitly. It is these passages that formed the criterion for the classification of questions as made. Without an analysis of the contents of the film in separate scenes or fragments of scenes it would, in fact, have been impossible to evaluate the research material collected. One should never forget the relativity of such a classification.

## 4 The course of the experiment

This section will refer briefly to the pre-test, the showing of the original and the experimental film, and the acceptance of the questionnaire.

### 4.1 The pre-test

The pre-test took place directly preceding the showing of the original and the experimental HONG KONG film.
The pre-test was restricted to an essay question 'What do you know about HONG KONG?' and was meant to show a possible knowledge of the film. If this had been the case, the filled in questionnaire of that pupil would be left out when processing the answers. However, none of the pupils showed such pre-knowledge.

The answers given were classified on a five point scale from -- to + + and verified by a colleague geographer. Pupils in the control group scored better than in the experimental group.

At a first sight it seemed more appropriate to hold the pre-test some time before the experiment and to use the scores to specify and to verify the division in a control group and an experimental group. However, the pupils would certainly discuss with each other the unusual assignment and no doubt some of them would do some investigation in books and encyclopaedias. Because I dare not run the risk of influencing the experiment by such (in itself) positive pupil behaviour, I made the choice of undertaking a pre-test directly preceding the experiment.

### 4.2 The showing of the original and the adapted version of the documentary film, the acceptance of the questionnaire

The experiment was carried out on June 18th 1959 between 8.30 and 11.50 a.m. in the geography room of the school.
Because the testgroups were small, 34 persons each, and a positive feeling in general existed with respect to the subject geography, much attention was paid to the physical situation and the mental climate during the experiment.
Except for the principal of the school, nobody was informed about the experiment.

During the experiment the two testgroups were kept apart. Teachers whose classes, were half empty consequent upon the absence of testees, involved in the experiment, were asked to give the remaining pupils (whose turn was next) an opportunity to work by themselves. These colleagues proved very helpful and obtained, afterwards, full information on the experiment.

First the control group saw its version, the original one, then the experimental, the adapted version. For both groups, the experiment was undertaken under similar conditions. But the control group gave the impression of working more enthusiasticaly at the pre-test, of participating more actively in the film performance and of getting down to answer, after some hesitation, the questionnaire. The experimental group on the other hand, proved less active and energetic but quietly set to work, without any sign of resistance to do the questionnaire. (Later on this observation was confirmed by the findings concerning the pre-test.)
When I asked the pupils, after the performance, to participate in answering the questionnaire, a rather unusual assignment, I argued that the learning from a film used in education should be measured from time to time in order to account to the school board for the rent and postage of the film. This was understood by the testees. The pupils were used to answer essay questions, so in this respect no particular stress could be expected, and indeed did not occur.

Looking back, it was a happy circumstance that the control group had been chosen (because they were time tabled to see the film in the early morning hours when their attention was expected to be at its highest level) to watch the original, the difficult version, first, then came the experimental group to see the adapted version,

the more appealing one. Certainly it would have been possible to organize the film shows for both groups in the same time period, but consequently I would have lost sight of one of the groups and by that missed crucial information, such as the observation, possible unexpected questions, explanation etc. So my choice was for the one after the other, and the control group first.
(During the first geography lesson after the film had been shown the pupils inquired about the meaning of the unusual 'filmlesson'. The pupils belonging to the control group wanted to see the adapted version and after the performance, were indignant about the information withheld. Only after a full explanation of the HONG KONG experiment and the assurance that wrong answers could not and would not effect their geography mark, did they relax.)

## 5 Processing the questionnaire, the findings

When analyzing the essay answers to the questionnaire, the data given by the testees were carefully recorded. The degree of interdependence between the data was studied within the answer to a single question and, if relevant, between answers to different questions.
The account of each question was done, in principle, using the same scheme:

1. the question with the answer as deduced from the film by the researcher;
2 an analysis by the author of sources of the content of the images and text for the question under consideration;
3. a table in which is given an overview of the answers as given by the testees;
4. a discussion of the answers.

The scheme was 'filled'in for the control group and for the experimental group; the order of the three categories of questions, as mentioned, in the section about the plan of the experiment, was kept.
To test for the statistical significance of the findings, use was made of the X2-test, a handy statistical method for the type of research in question.

In a discussion of the results of the experiment I should like to begin with the most conspicuous difference between the original version and the adapted version, the maps that had been inserted.

Of the three maps, the situation map could best be evaluated.
This map - a filmed map of the Crown Colony especially drawn for the purpose - together with the data still to be dealt with in the film and commentary, which stimulated the testees of the experimental group to careful observation, caused the test scores of the experimental group to be higher than those of the control group. This appeared from the significant differences in the answers to the related questions.
From the answers it appeared that the testees of the experimental group knew what was meant. The information which can be derived from the contents of the picture and of the commentary, now became meaningful as they knew the topographical situation and consequently the relation between some of the relevant geographical

data. This indication is further emphasized when we consider the greater active interest of the control group, whose answers statistically were far behind those of the experimental group.
The testees of the control group saw the original version, a film though in which there were no maps at all. Although the 'map questions' could also be answered after a careful study of the various scenes of the film; from the results, it appears that the testees of the control group were not at all, or not sufficiently, able to do so.
Owing to their lack of geographical orientation the testees of the control group did not know what to do with much of the data given in the film. And that was not all, they also mixed up all kinds of data. It is owing to the active interest and energy of the control group in answering the questions that this confusion shows up so clearly. In this respect it is instructive to compare the wrong answers to a number (four) of questions. The fact that it is only to these questions that more testees of the control group than of the experimental group could not produce any answers, is an indication of the difficulties of the control group.

The general map of East and Southeast Asia had indirectly proved its usefulness. This appears from the indicative difference between the answers to questions with reference to 'the situation' of HONG KONG.

The globe map and the place where it was inserted seemed aesthetically justified. The interest of the test persons of the experimental group in the HONG KONG area was roused in a filmic way. It proved impossible, however, to draw conclusions about the educational value of this map from the answers to the relevant questions, neither was it possible to evaluate it directly by means of questions. If one assumes - and in my opinion rightly assumes - that the aesthetic approach to a subject, which, moreover, is in accordance with the fundamental possibilities of expression of the medium chosen, must somehow produce results, one must prefer a method of catching the attention and letting it go again, as it was applied in the adapted version, to a simple title.

A second complex of alterations in the adapted version was formed by the changes in the commentary.
These changes concerned a clearer connection between various parts of the text, simplifications, repetitions, recapitulations. A study of the answers of the two test-groups yielded neither significant nor clearly indicative differences. But some questions seem to justify the supposition that alterations in the text may have been valuable. For in answers to these questions the experimental group comes up to the level of the more active control group and even surpasses them to some extent. Moreover it appears that there is a certain shifting of the attention. This takes place when one item out of a smaller or greater complex of items in the pictorial and verbal contents of the film is further emphasised both visually and orally.

More interesting than the results of the alterations in the adapted version are, in my opinion, the remarks that could be made with regard to the value of the commentary + image. It appears that where the commentary is mainly concerned

with the contents of the images of the film scene, this commentary can be reproduced by the testees.
The importance of the commentary about the contents of the pictures is further emphasized by the results of the commentary about the situation map. In the discussion of the situation map it appeared that the testees of the experimental group had listened to the commentary and had complied with the request to observe the map carefully. The value of unconnected commentary i.e. without a clear connection with the contents of the images, is doubtful. This is clearly indicated by the answers to some questions. It stands to reason that the testees pick up something from the unconnected commentary, but in view of the total sum of the data the efficiency of those parts of the text that have no connection with the images is slight. It hardly serves a useful purpose to raise a complex problem solely by means of a single remark in the commentary.

The aim of geographical education in secondary schools must not be the teaching of unconnected facts and definitions, but it should teach the pupil to see the relations between facts and ideas, teach the pupil how to use them and thus stimulate geographical thinking. Such a use of ideas requires a dynamic mental activity on the part of the pupil, for which the guidance of the teacher is a necessity. Often I have been surprised to notice how the thinking process of the pupils had to be stimulated again and again, even in analogous situations. The answers to a number of questions in the HONG KONG experiment proved once again how much such guidance is needed, if the pupil is to learn a correct use of ideas both with reference to the contents of the film itself and to the relation between the film (or parts of it) and geographical subject matter in general.

The answers provided a remarkable illustration of the inability of the testees to see some pretty obvious relations between different parts of the film. So it was hardly surprising that questions about more involved relations between ideas in the film were rarely answered correctly. That the testees did not see any relations at all, or at best insufficient relations between the contents of the film and the geographical subject matter to be studied formed a most important part of the findings; in the discussion of the answers this problem has been fully dealt with.

## 6 Conclusions and recommendations for further research

As far as could be demonstrated in this experiment, the insertion of the situation map in the adapted version formed an essential improvement compared with the original version. A great many geographical documentary films which are meant to provide the spectator with information about a certain area, contain few explanatory maps or none at all. A careful study of all the right and wrong answers to the questions relating to the maps justifies the conclusion that in a geographical documentary film, a number of effective maps in places, justifiable from an informational point of view, are indispensable.
An investigation into the requirements these maps must have, deserve careful examination. This would not only be useful for geographical education, but also for

the presentation of information about foreign countries in general, particularly for the many television documentaries.
When studying the requirements, one should start from the functions those maps may have in the process of giving the viewer a good idea of the subject in question and in connection with these functions the form and contents of the map, the place where it should be inserted and the period of projection should be studied.

As far as the commentary is concerned, it may be concluded that the commentary to a film should support the contents of the images of the various scenes and the content of the film as a whole. In the documentary HONG KONG, like in most geographical documentary films, this is rarely the case. This may partly account for the fact that the alterations in the commentary itself did not result in a clear improvement. This can only be accounted for by the essential character of the medium.

A sound film consists of image and commentary. The images are a complex of interrelated parts, a pattern which we can observe. The spoken word provides the image with explanation, elucidation or commentary. The commentary cannot be independent, for then it is no longer commentary, but a spoken text which happens to refer to the same subject as the film. Such a text, however interesting, should be recorded on the tape of a tape recorder and not on the soundtrack of a film.
It seems to me of the utmost importance for the teaching of geography that the producers of educational films and documentaries should make up their minds as to what is a film and what it is not; it should not be a series of moving images illustrating talks, but a complex of images produced with a full use of all the possibilities of the medium, together with a not too copious commentary which is strictly limited to the contents of the images. Therefore a manageable, instructive, study book on theory and method concerning films for education and documentation is needed.

And to end with, the adaptations made to the HONG KONG documentary proved to be worthwhile; within the limits set, the objectives were attained to a high degree. At the same time a more precise and overall view about the educational implications of the film was gained.

## 7 Thirty years later

At first sight, the findings of the HONG KONG experiment might, after thirty years, not seem exciting anymore. The point is however, that only very recently is interest developing, in a qualitative sense, in the informational value of knowledge products such as textbooks, films, video programs and software. This has to do with the awakening of consciousness about the role of information and communication in society. Therefore the HONG KONG experiment and its findings are still today of significance as such, and in particular in stimulating thinking about the improvement of information.

In recent years reverse engineering of software has been studied. The aim of reverse engineering is to make available for re-use existing low quality and out-dated software. As constructing new software is very costly, overhauling and modifying existing software might be less expensive.
In principle the HONGKONG experiment can be identified an example of reverse engineering before its time.

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# SERVING THE KNOWLEDGE-BASED SOCIETY : RESEARCH ON KNOWLEDGE PRODUCTS

## Part II : IN SEARCH OF THEORY AND METHOD TO DESIGN EDUCATIONAL GEOGRAPHY IMFORMATION (1974-1984)

### 1 Introduction and context

Ten years after the publication of the Hong Kong experiment, in 1974, the second research, within the continuing research on knowledge products, took off.
The research was concerned with the study of the theory and method of designing geographical information in the sense of geographical knowledge. The author experienced this as a broadening and deepening of the essential nature of the Hong Kong experiment and other former research. The context was given by a newly founded graduate study in human geography.

Given that changes in society occur continuously over time, the Board of the Faculty of Geographical Sciences at Utrecht University has the responsibility of considering and revising regularly various curricula. The need was felt for a graduate study in geography which could better serve education defined in a broad perspective. All graduate studies, however, were aimed at field work in the Western World, as well as in the Third World.
The Faculty Board invited the author, since 1964 appointed as educator and trainer of geography teachers (at Utrecht University), to take part in the foundation activities of the new graduate study.

In the following pages will be given, from documentary evidence, the consideration given to the new study, its organization, and an account of the search for a model to design geographical information. As far as is necessary for a good understanding of the study as it stands, other aspects will be mentioned.

### 2 Posing the probleem. The 'what', the 'why, the 'how"

**The 'what'**
On May 28th 1973, the Faculty of Geographical Sciences of the University, Utrecht, decided to establish a graduate course of study on education for geographical information provision.
By education is here meant formal, non-formal and adult education as well as public information. The decision was in conformity with the findings of a select Advisory Committee. Of course not all members of the Board agreed with the new ideas, but the decision could be taken by majority.
In view of the coming information and service-based society with its far reaching technological changes, it could be expected that the demand for reliable, high-quality, information, in the sense of knowledge, would increase strikingly, and that as far as the geographical features were concerned, the discipline of geography

could adapt to this development. Geography in the new graduate study, though, was taken to be an applied science.

**The 'why'**

The decision to start this graduate study was taken in the light of the changes which society and especially Dutch society was likely to face, in the near future. Among these were demographic changes. The Netherlands having entered into the post-industrial phase of demographic development, which meant fewer pupils, and thus fewer jobs in formal education. On the other hand it also meant more elderly people, and thus more potential clients for adult education as well as for public information.

It was further hypothesized that education and public information in the near future would have to assume a role very different from that in an industrial society.

There would be a greater need and demand for education in the sense of understanding and knowledge. The extension of education will be determined by such factors, as increasing mobility, greater leisure time and the internal and external democratization of society on the one hand and the expansion and improvement of the so-called mass communication media on the other.

It was clear that new spheres of work could be envisaged in the then (1973) still scarcely featured and partly unknown jobs within the field of education, information and communication. Rightly so, the initiative to react orginated with the discipline.

Modern geography with its explanatory character could contribute to relevant and qualitatively high information. The academic geographer with his thorough knowledge of the discipline could be educated and trained to provide the information, in the sense of knowledge, likely to be in demand.

**The 'how'**

To reach the aims set, it was necessary to study the new field as a whole integrated system. The new graduate study though should stand on its own feet and was essentially not connected to actual educational communication situations such as schoolclasses and adult group work. It was to be expected that in a knowledge-based society both professions: the information/knowledge designer and the teacher/educator need different specific qualifications.

Thus, within the Faculty Board the new MA-study got its form on the bases of the requirements as formulated, in principle, in the reports of the Advisory Commission. On the one hand the study of the discipline should be continued and expanded, and on the other hand the theory and the methods of designing geographical knowledge for educational-information purposes should be studied and exercised.

The MA-course of study would take two years and was to be named 'Geography for Education'.

## 3 The organization of the MA-study 'Geography for Education'

The structure of Geography for Education as described below has remained the same over the years. Slight adaptations have had to be made as to the disciplinary subject matter to be taught.

Graduate study in Geography for Education is a two year course, entry to which depends on candidates having passed a three year undergraduate course in human geography. The MA-course consists of a principal subject and two subsidiary subjects.
[At the beginning of an academic study of Geography, in the Netherlands, students have to make their choice between physical geography and human geography. However all students also have to study modules concerning respectively, human or physical geography, during their study period.]

The principal subject of Gegraphy for Education comprised three study modules, as well as learning how to undertake research and the writing of a thesis.
The three modules being:

- an introduction to the knowledge and service-based society and its implications for formal, non-formal and adult education and public information. This was followed by a course on the theory and methods of developing, designing and making geographical information;
- the study of modern trends in human geography;
- the broadening and deepening of discipline knowledge, especially in regional geography (The Netherlands, Western Europe, Eastern Europe, certain Third World regions) including two one-day excursions, a twelve days' excursion alternately to Western and Eastern European regions.

Within the discipline modules, learning how to undertake research, concerning educational information processes, is included.
Each research training project is undertaken by a project group, for team work experience, consisting preferably of four persons. In a personal thesis the student had to work out in detail an aspect of the research project.
The project group consisted of as well as the students and the guiding staff member of Geography for Education, also a staff member of the Geographical Institute who was an expert on the subject matter covered by the projects. The output of each research project should have a content and form that could be used in practice. (A full list of the research projects is available and published in the different symposium papers.)
The research project covered an exercise, along methodological lines, in the development of geographical information in any media form for formal, non-formal and adult education or public service. As many as possible the topics of the research projects were to be chosen in cooperation with or on request from a variety of socio-economic or cultural institutions. This was to involve the students, to make the graduate study realistic and to give publicity to the graduate study. Each project group had to report in a written form about the experienced development process and to account for the decisions taken. These process descriptions appeared to be of great importance.
As far as the subsidary subjects were concerned, above all they had to support the main study. This was specially the case with the subject studied for six months, which had to be totally or partly related to the geographical discipline, or in support of the research topic. The subject studied for four months, the so-called little one, was an optional one, but most students chose subjects in social, the communication or the education sciences.

This was the situation between 1974 and 1984. Then changes in the duration of the graduate studies took place.
Consequent upon the financial problems of the universities combined with changing ideas about the function of academic education (in higher education), academic study in the Netherlands since 1984 takes four instead of five years. So from 1985 onwards the graduate students in the Geography for Education only had 1 year and 8 months for the main and subsidary subjects and the preceding study in geography was also much shorter.

## 4 In search of a theory of and a method for the design process for educational geography information

After the graduate course Geography for Education got its form, the agreed programme had to be filled in.
As far as the purely geographical features concerned this was not a problem, essentially, the expertise was available at the Institute. (It is true, however, that by the early seventies, the regional geography and its methods were a bit neglected in favour of the quantitive aspects of the discipline.) Anyway, experience of the theory of and method for the development of geographical information was not available. But it was supposed that this expertise could be found in the literature about curriculum projects and studies carried out in the late sixties and early seventies.
As sources two types of projects and studies could be distinguished: first those executed under the responsibility of academically trained geographers, and mainly of English, US and German origin; the second group concerned the large field of curriculum theory and planning, particularly in educational technology, involving the development of learning units and instructional design, seemed of importance. These source materials originated mainly from England, the US and Germany. The full findings of the literature study are published in congress and symposium papers. (See reference list.)

Summarizing the findings, it can be argued that although both source groups, the geography projects and the curriculum studies, contributed each according to its nature to the needs of producing information units and thus, interesting views and remarks were found, no workable model or set of rules for the development process of information could be found. Looking back this was not surpising because the projects and the studies were directed, not towards the construction of the content of the information, but towards educational situations in which the selected content, could be used. However by then, all educational thinking was largely curriculum bounded, and the different geography projects followed the curriculum trend. In any case, the curriculum theory failed to meet the demand for theory and method, concerned with designing content.
A BBC executive replied, when asked about educational designing activities, that designing and realizing an information programme is difficult and time consuming, especially if it is to be clear and honest. He further stated that the average user had not the slightest idea of the underlying design process and that as far as he knew no really helpful literature was available.

How could this newly arisen blackbox situation be mastered?

Posing questions and problems in a foot-loose way had to be avoided. The design process though had to be approached essentially as a system wholly integrated.

The best way to proceed seemed to be on a pragmatic basis: to begin to develop geographical information, to watch the process carefully, to notice what was happening, to protocolize all activities, to discuss the procedure and to visualize the development in a diagram. A small staff set to work in the fall of 1974, together with graduate students who had chosen the new Geography for Education course and the subject experts within the Geographical Institute.

Fortunately we could begin with two commissions from the field: one on European Population, a combined commission from the Council of Europe and the International Council for Educational Media (ICEM), and a second on Landconsolidation in the River District (the land between the rivers Rhine, Waal and Maas).

Consequently kinds of specifications were available for the design and production of a geographical information output. The two initial projects were soon followed by a purely staff run project on geographical information concerning the Green Heart Metropolis (The Randstad).

The first generation of projects, nine altogether, led to the formulation of five theses and were presented at 23rd IGU congress, Moscow, July/August 1976.

The theses numbered one to four gave generally the what, why and how of the graduate course Geography for Education, whereas in the fifth thesis, were laid out the phases of the design and realization of educational information as identified during the work at the first nine projects. Moreover the fifth thesis formed the basis for The Randstad Holland Exhibition of the Information and Documentation Centre for the Geography of the Netherlands, and held during the IGU congress in Moscow. Together with its full methodological acknowledgement the exhibition was much appreciated by visitors, among them designers of geographical exhibitions, as they themselves testified.

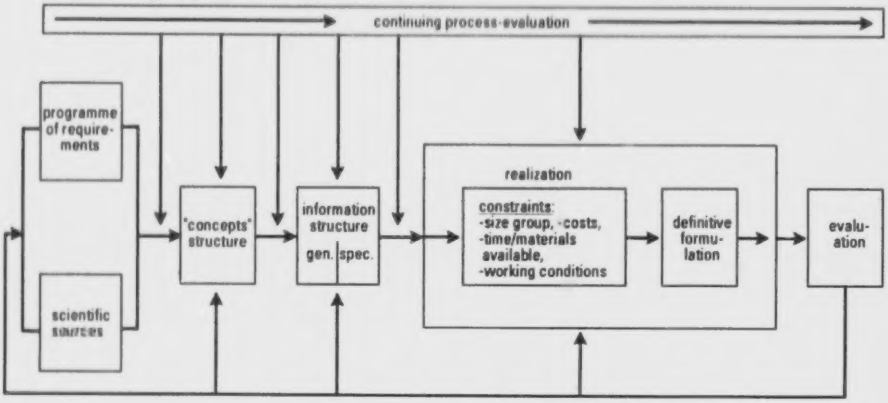
The phases as distinguished in the fifth thesis in turn formed the point of departure for the second generation of research projects. It needed another nine projects to express the next step in the process of designing geographical information: a conceptual model.

Thinking about structures and processes is facilitated by visual representation. When visualized, the experienced design processes of the second generation projects offered a very complex and literally wide picture. The most striking phenomena, causing the complexity and the breadth of the models of the second generation projects separately, were the acting anew, over and over again, as well as the constantly harking back to decisions earlier taken. This way of proceeding was a brand new experience for the students, giving rise to many discussions. The students felt there was virtually no connection between what they were now doing and the written tasks they had been set in earlier academic years.

Because the methodological foundations of the second generation projects was in principle identical, viz. conformed with the phases identified in the first generation projects and formulated in the fifth thesis, the separate and unique process images

could easily be condensed into a general conceptual model. The abstraction was discussed with the participating graduate students and valued positively.
The conceptual model was first presented at the symposion of the IGU's Commission on Geographical Education, University of London, Institute of Education, April 1978.

Over the years the conceptual model continued to arouse interest, it proved to be rather useful for the carrying out of the third generation projects. Gradually more insight was acquired into the mutual coherence of the elements within the model as well as into the connections with elements outside the model. This was rendered in a paper given at the symposium of the IGU Commission on Geographical Education, 24th IGU congress, Tsubuka/Tokyo, 1980.
When experiencing the conceptual model the feeling gained ground that the control on the design process as an entity could be better.
In the course of 1982 then, the first model-element being 'objectives/target group in general' was replaced by 'programme of requirements', a far more comprehensive one, in view of the guiding of the planning process and of the unfolding of an awareness of the final product. By this it was clearly recognized that the theme and its elaboration in respect of the type of education and public information formed the central point. In fact the substitution of the first element meant the very essential and clearly denoted step of changing from a curriculum orientation to a product orientation. The other elements of the model could remain the same, proof that the early, but not sharply distinguished vision of an information product to design had been along the right lines. The fourth generation of projects could take off.
The idea of proposing and formulating a programme of requirements was taken from the world of industrial design.
The model in its new composition was first presented at the Annual conference of the National Council for Geographic Education (NCGE), Ocho Rios, Jamaica, W-I, October 1983. It is felt that the model has now reached a status of maturity and can be given below.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-time/materials available,
-working conditions
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A model for designing geographical information

Parallel with the progress made in studying the development of the model the function of the research project altered slightly over the years. The first generation of projects contributed, by means of the theses, to the origin of the conceptual model, the second generation led to the formulation of the conceptual model and finally the third generation was instrumental in developing and devising the product-based vision.

It was interesting to observe how the graduate student's behaviour adapted when, in the course of time, more precise methodological knowledge became available. At first, they found the model unproblematic and began to use it in a loose and self-evident way. As a result, more questions in relation to the specific design environments of the distinct geographical information products were raised. They were difficult to answer and finally led to the research on the construction of geographical knowledge products as described in the third part of this book.

Reflections about the genesis of the model and its distinguishing elements as well as experience with the model as an instrument and the product vision are described in great detail in different papers and articles published over the years. (See reference list.)

## 5 The graduates' enter on the labour market

Much more could be told about the development of the graduate course Geography for Education. However interesting, this would be less relevant to the purpose of the informational design questions under consideration. An exception must be made with regard to the jobs the graduates got; after all it is in relation to the labour market that the newly designed course could find its justification.
The following data concerns 125 human geography students who had graduated from the Geography for Education course by April 1983.
The search for the exact number and type of functions was undertaken in preparation for the inaugural address consequent upon the foundation of the chair of Geography for Education at Utrecht University.

Did the graduates indeed get the jobs, newly created or the better designated old ones, as supposed in the section 'Why' when applying the course 'Geography for Education'. Although the period under consideration being rather short, the graduates were still at the beginning of their career, and the anticipated social/economic changes were developing only gradually, some remarks can be made.

Over the period 1974-1984 circa 50% of the graduates still found a job in regular formal and in non-formal education. It must be realised that the teaching profession is well known and that only recently has employment in formal education declined, whereas in non-formal education it is growing. Moreover it appeared that in practice principals of secondary schools prefer to appoint Geography for Education graduates in view of their acquaintance with educational information provision.

By 1984 around 40% of the graduates had found work for which the designing of educational-based information, often with a relation, in some form, to the discipline of geography, was a recommendation. Most of the jobs tend to be in the broad service-based, but clearly knowledge oriented, field of communication, management and public relations. To describe these jobs would take us too far. They show a great diversity at the level of every day work.

The main categories can be mentioned:

- informational tasks of spatial planning at the governmental, regional and local level;
- information provision for environmental problems, educational/cultural and social tourism, recreation facilities, urban renewal and educational reorganisations;
- author's/editorial functions for geographical publications (textbooks, magazines) and for media-programmes, exhibitions, scientific enlightenment, investigative journalism, informatics (programming);
- information provision about: energy problems, third world regions, newly industrial countries, third world/western world relationships.

It showed the self confidence of the graduates that they had the courage to respond to advertisements for which a geographer was not specifically asked.
And finally 10% fell within the statistically diverse category. Some continued their studies, others travelled at ease through the world and some simply dissolved in society.

## 6 An extension: Geography for Education/Regional Geography

As became clear over the years and rightly so, the most important discipline source for the graduate study Geography for Education was Regional Geography. When by the mid-eighties Regional Geography as such experienced a worldwide a revival, it was quite self-evident that Geography for Education and Regional Geography were brought together in one department. Both applications of the discipline certainly would support each other, after all the graduates of regional geography also have to find a place on the labour market. Although the instrument for designing geographical information had proved most useful, it was decided that further research to reach greater refinement should take place. On balance we face a society where knowledge plays a prominent role.

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# SERVING THE KNOWLEDGE-BASED SOCIETY : RESEARCH ON KNOWLEDGE PRODUCTS

## Part III : EXPLORING THE CONSTRUCTION OF GEOGRAPHICAL KNOWLEDGE PRODUCTS

### 1 Introduction and context

When the Faculty of Geographical Sciences of Utrecht University, decided in the early seventies to establish a graduate course focused on the study of the design of geographical information for educational purposes in a broad sense, the underlying ideas were formulated in anticipation of the developments in society. And, as could be expected, the assumptions had a rather low profile (see part II).

But in the course of time the profile underwent refinement and by the middle of the eighties it was clear that the demand for geographers, educated and trained to master geographical information design processes in some way, had increased. Consequently the growing professionalism needed to be improved and extended. This meant further inquiries into the theory and method of the construction processes involved.

In this context, I got the idea of analyzing a final geographical knowledge product in order to tease out the design process involved in its construction. Until now the design process was studied in a forward direction. My retirement enabled me to devote time to such a type of research.

Unfortunately the literatue concerning the humanities then included no publication focussing on cognitive studies of the analysis of the processes underlying knowledge products.

### 2 Posing the problem. The 'what', the 'why', the 'how'

#### The 'what'

The essence of the research project was to gain an insight into the construction process of geographical knowledge products as experienced by the constructor. It could be expected that a process analysis of a high standard geographical knowledge product would throw light on the way the development in an intellectual sense had taken place. Such insight might lead to suppositions about the role of the model as researched and described in part two of this publication. In other words the focus would be on the experienced growth-process of the knowledge product.

As the two concepts mentioned viz. 'geographical knowledge product' and 'construction', will be put into actual use in the project under consideration, some explanation as to the concepts seems necessary.

The idea of an outright product approach was prompted by the research findings as described in part II, together with developments in society focussing on design problems in different areas as displayed in design museums and exhibitions on the growth processes of industrial products. Consequently, gradually, were disclosed the assumptions concerning product-directed thinking and production-directed thinking. Knowledge in the sense of 'specific information about a subject' clearly refers to the function of the product.

Thus by a geographical knowledge product is meant any output wherein specific information about a geographical subject or a strongly geographical based subject, is given a distinctive form. And since an effective product should be a system in itself, a knowledge product may be defined as a kind of information system.

The aim of a knowledge product, in its turn, is to inform students in formal and non-formal education and human beings in society at large. So books, papers, films, television and radioprogrammes, exhibitions which expose, explain and disseminate knowledge, can be characterised as knowledge products.

A short comment now on the use of the term 'construction'.

It was the product orientation which lead to the term construction. Each product, as a matter of course, went through a process of construction.

After thorough consideration, the noun 'construction' was chosen to specify a process being essentially a growth process in a mental and physical sense. By introducing 'construction' terms such as design, realisation, making, need not be used. They also belong to a vocabulary which indicates a process of output coming into existence but unfortunately they are often confused, not to say mis-used.

An attractive alternative was found in the term 'construction', and on reflection the term gained in acceptance.

This preference then was determined by the fact that knowledge products always have to do with a full human creation. To construct, inherently means to consider, to build up according to certain requirements, to take into account rules, workplans, etc. And, of course, a product is always a construction.

The idea of construction lies also at the root of the replacement of the first element of the conceptual model as seen in part II of this study. The term 'construction' was not used then.

### The 'why'

Why was this research project undertaken after the preceding investigation which led, through three generations of projects, to the conceptual model as described in part II under section 4.

However practical it seems to handle, the conceptual model is and remains an abstraction. Consequently the information designer in the concrete situation who wants to use it as a 'manual' has in fact to experience how to manage the model. Feelings of confusion arise, outlined development threads easily get lost. This experience virtually gives an invitation to have a close look at the final product, the conceptual model available. After all the conceptual model was derived on a sound scientific basis, and given that assumption, its further use is acknowledged.

Thus it seemed meaningful to try to acquire an understanding into the growth process of some high standard geographical knowledge products in a reverse direction and to use the essentials of the conceptual model as an instrument to analyze the sources. It could be expected that the proposed research would help forward the study of the theory and method of constructing geographical knowledge products.

**The 'how'**
How may we reach the objective as set under the heading 'What' and justify the 'Why'?
A reasonable possibility seemed to be to select some high quality geographical knowledge products, then to contact the authors and ask their cooperation to unveil the underlying process of construction. The construction process though must be seen as the source of the research. To tap the source required utmost care and this applied both to the choice of the knowledge product and to the unveiling of its construction process.
As an instrument to analyse the sources, use would be made of four rules of thumb. These were derived from the conceptual model developed in the research described in Part II, as well as from the lessons learned from experience of its use.
In short those rules concerned: the programme of requirements, the expertise, the conceptualisation/structuring of the content/the manuscript of the scenario and the media realization.

Learning to know about the construction process as experienced could take place by an interview or by asking for a description or by something in between: an interview + (subsequently) descriptive notes, or a description + (subsequently) interview-like questions.
In an experimental set up, the author of a high standard geographical knowledge product was interviewed about the construction process. The interview method, however, turned out to be less suited for the purpose of the research. What happened?
The construction process, as an entity, was explicitly clarified by the interview questions. In other words the construction process as elicited by the interview appeared as a branched, businesslike structure, and, it was felt, that the process as an original experience, was submerged. The artificiality became obvious when going over the interview notes. What would be the source, was thus structured under the influence of the interview; a scientifically unsound situation. Thus a process description by the authors with the possibility of inquiry-like questions afterwards seems the best method, although the most labour intensive.
Further the description method also had its uncertainties, but it missed the tension of the confrontation between the interviewee and the interviewer whose questions might falsify the construction process as experienced.

[The experimental interview was held in spring 1987 with Dr. G. P. van de Ven, social geographer of the University, Nijmegen. Dr. van de Ven was co-author of an exhibition on the work of Jan Blanken (1755-1838), an Inspector General of Public Works who, among others, regulated and reordered the water drainage systems of the land between the great rivers, Rhine/Lek, Maas and Waal.]

The ideas as elaborated in the research project and its execution needed as well as to a full publication also a more personal dissemination. To meet this aim a one-day symposium was to be held in Utrecht, in the spring of 1989.
Authors and a group of 25 to 30 interested constructors of geographical knowledge products would meet and discuss the nature of the construction process.
The 'How' of the research project will get its application in the next section.

# 3 THE SOURCES: PRODUCTS, PROCESS DESCRIPTIONS, RELIABILITY

## 3.1 Choosing the geographical knowledge products, conditions and outcome

Choosing the geographical knowledge products to undertake the research project has been a great concern as might become obvious from the following.
Although, sufficient geographical knowledge products were available, in the context of the research undertaken the choice was limited.
The framework was determined by some very special preconditions.
Those, closely inter connected, were:

- the *quality* of the knowledge product;
- the existence of a positive *relationship* between myself as *researcher* and the product's *author* and vice versa;
- the *media* used to communicate the content; these must be *diverse*.

As a measure of the *quality* of the product the conceptual clarity of the content was used. This clarity was to be understood from the content as expressed by words and visual images.
Unfortunately clarity of concept and optimal expression don't always go together. A good conceptual structure might be ruined by unsound use of word and image, whereas the absence of a conceptual structure might be masked by a creative use of word and image. It is important to be able to discern where weak content is hidden behind a facade of elegant phrases and attractive images. Basically the value of a knowledge product is anchored in its concept.
Thus, assessing the quality of the geography knowledge product suitable for the research under consideration meant a thorough knowledge of the theory and the application of the discipline, together with a precise understanding of informatory and communicatory conditions and facilities for education and public enlightenment.

Together with the quality of the knowledge product the *relationship author/ researcher* was of crucial importance. The authors would be invited to describe the development, design and production process, that is, the construction in a creative sense of their knowledge products. This was certainly a rather unusual request and was demanding to fulfil.
If reflecting on and above all writing a report on an experienced process is itself already out of the ordinary, the more is this the case if the document is to be used for methodological analysis.
Concocted stories had to be prevented, they would injure the scientific value of the research. The author had to have the courage to accept that he or she would be vulnerable, and he or she must be relied upon to give an honest description of the construction process.
On the other hand the author needs to trust the researcher since it could be argued that this type of research being new, might harm the author. Therefore mutual confidence between author and researcher was a necessity. This, however, was a real restrictive factor when selecting the knowledge products.

The third determing factor was the *media* used to communicate the product. It was explicitly decided to choose media variety in stead of media similarity. It was felt that a diversity of media would possibly better illuminate the construction process of the knowledge product in its fullness, whereas a similarity of media would nearly self evidently, lead to a comparison of the specific use of the media concerned. In the latter case then the content would support the media instead of the medium the content.

And in the context of this research project I wanted explicitly to prevent a dominating role for the media, the entity of the constructional process was my strong concern. This was so because the study of the process of growth of a geographical knowledge product is so often still neglected by the discipline or more likely has not caught the attention of researchers. So media variety would give the best assurance of reaching the goal.

Finally I had in mind nine geography knowledge products meeting the researcher's demand concerning the cluster of conditions on: quality, relation researcher-author and media diversity.

The nine originated in: USA, 3; UK, 1; Switzerland, 1; FRG, l; Netherlands, 2. Four out of nine were selected. Why four, why the four chosen?

Three reasons can be mentioned:

**First.** Four seemed a manageable number, and the size of the publication would not be too large. The nature of the work to be done was painstaking and thus very demanding. Empathy with the authors during the cooperative endeavour as well as the searching analysis was a matter of high importance. A larger range of knowledge products seemed, therefore, counterproductive.

**Second.** The authors of the products to be selected had to be in a literal sense within easy reach of the researcher. The accessibility of the nine authors varied to a certain extent.

**Third.** International cooperation was much desirable, however an entity in culture appeared necessary. The choice then was a combination of the two Netherlands products with that from the UK and one from the USA; English would be the working language.

The one from the USA was to a high degree determined by the fact that the researcher had been involved in aspects of the construction process of the product (as a local consultant).

Summarizing, the four geographical knowledge products chosen for the research project were:

- a project consisting of ten video-programs, USA (audiovisual media);
- a textbook, UK (print media);
- an exhibition, Dutch (visual display);
- a congress paper, Dutch, ('written' document);

### 3.2 The authors invited to write the process descriptions

The authors of the four selected geographical knowledge products were approached in person in August and September of 1988. They were all somewhat surprised at the nature of the request. They asked for further details, especially concerning the reason for and nature of their eventual contribution and the procedures to be used. Then soon they began to understand the nature of the research project.

Giving an account of a process once experienced as a flow-event seems difficult, but also attractive to a certain extent. Recording the event straightforwardly on paper was felt to be a challenge. After some initial hesitancy the authors declared explicitly and whole-heartedly their willingness to cooperate.

The authors of the selected geographical knowledge products were thus requested to undertake a description of the construction process as they experienced it. Of course the authors were free to work from whatever documents they had, if any.

[The idea that documents, such as letters and reports, produced during the construction process, might be analyzed, was rejected because of the casual or incidental nature of these documents.]

On the basis of research as described in this publication's second part and explained in the 'How' of the research project, in the part under consideration, four rules of thumb to function as a methodological instrument had been formulated.

In a letter, written directly preceding the execution of the commission (thus some time after their promise of cooperation), the authors were informed straightforwardly and in plain terms about the rules of thumb. The authors were then asked, after they had written their process description and reviewed their contribution, if they could identify, in the process structure, the rules of thumb.

As the researcher I hesitated for quite some time in taking this decision. For it could have been possible that the authors would use the rules as a guiding principle for their process description, and consequently the research as planned would have suffered some interference.

But equally the request to identify aspects of the rules of thumb in the process after finishing the description, could inspire confidence in the cooperation between the authors and the researcher. The authors would feel themselves to be a genuine part of the research project and ensure the continuity of the research. It could be assumed that this point of view would accord with the scientific attitude of the authors, all of them were experienced researchers, as is evidenced by their having undertaken in the past, Ph.D. research leading to the writing of a thesis.

Therefore after ample consideration it was decided to make known the rules of thumb to the authors and to ask them to assess whether they could be identified. Looking back, it has been a proper decision, as might become clear when analysing the sources and discussing the findings.

It was agreed that the process descriptions should be sent in early April '89, well before the symposium to be held at the end of May. The aim of this requirement was to prevent symposium experiences from influencing the written contributions. By the end of April all descriptions had been received.

What value could be attached to such descriptions as a source for the research? It must be postulated that such a complex, often interrupted construction process of a knowledge product, cannot be described from moment to moment, and the time needed to carry it out needs to be stretched. So to use a description as a scientific source is by definition a delicate matter.

The circumstantial exposition of the selection of the geographical knowledge products and of the cooperation with the authors as given in this section, must be seen in the light of the vulnerability of the description of a construction process as experienced by the authors.

Given the evidence that the variables involved were discerned, the sources may be credited with a high degree of reliability.

The texts of the descriptions will be published in their entirety in the next section.

# 4 THE PROCESS DESCRIPTIONS

## 4.1 Introduction and context

After an account of the selection of the geographical knowledge products and of the course of the cooperation with the authors in the former section, it is now time to give the full descriptions of the products' construction process as given by the authors. Those descriptions formed the researcher's sources.

The descriptions of the four selected geographical knowledge products will be given in the following order:

- the project consisting of ten video-programs, also a consultant's report is added (see 4.2);
  A.L. Backler, (1987), Project Consultant, The Global Geography Project. Bloomington, IN.: Agency for Instructional Technolgy.
- the textbook (see 4.3);
  F.A. Slater, (1986), People and Environments. Issues and Enquiries. London: Collins.
- the exhibition (see 4.4);
  L. Hacquebord, W.H. Vroom, (1988), Whaling in the Golden Age of the Netherlands. Arctic Centre, University Groningen/Rijksmuseum, Amsterdam.
- the congress paper (see 4.5);
  W.J. van den Bremen (1988), Pacific Rim and Basin, Unity or Diversity. Faculty of Spatial Sciences, University, Groningen.

In publications it is a good and sound habit to give with the author's name some personal information such as nationality, age, profession and the titles of other publications. It must be seen a courtesy to the author.
In the case of the process descriptions, the author's curriculum vitae data fulfil a specific information function. This will become clear in what follows.

Preceeding my request to the authors to write the process descriptions, I was not informed about their educational and professional background. Indeed, by then, I knew them more or less personally, but had no essential curriculum vitae information. The selection of the geographical knowledge product on behalf of the research project was based primarily on the conceptual quality of the product.
After studying the process descriptions I became much interested in the specific educational and professional background of the authors. So I asked them to send me their curriculum vitae, which I had intended to do anyhow, but only as part of the 'good habit' procedure when giving the finishing touches to the publication.
It is this curriculum vitae information, selected as to academic education and profession, which the reader will find after each of the descriptions.
The location of curriculum vitae-based data is thus in accord with the possible need to satisfy the reader's curiosity about the author after he has read a description. When I read the descriptions, I found it necessary to know 'who was who' among the authors.

Indeed, getting acquainted with the academic educational and professional background of the author, has been of great help to understand the conceptual quality and the organizational setting of the related geographical knowledge product. Thus the curriculum vitae-based data are far more than a courtesy to the authors, they became an integral part of the research.

It is here appropriate to thank the authors: Alan Backler, Frances Slater, Louwrens Hacquebord, Wim Vroom and Willem Jan van den Bremen for their close and lasting cooperation. Without their confidence in and sympathy for the project 'Exploring the construction of geographical knowledge products' could not have taken place.

## 4.2 Developing and realizing the Global Geography Project

Alan Backler, chief project consultant

### Introduction

**Global Geography** is a series of ten lessons in world geography specifically designed for grades six through nine (eleven to fourteen year old students). The series was developed by the Agency for Instructional Technology (AIT), Bloomington, Indiana, USA, in association with a consortium of education agencies in forty-one states and provinces in the United States and Canada. (See Appendix I for information about AIT.)
Each lesson consists of a fifteen-minute video program and accompanying printed material to facilitate classroom follow-up activities.
The printed material includes a teacher's guide. This contains an introduction to the series, objectives for each lesson, a summary, a glossary of key terms, teaching suggestions, follow-up activities, community applications, and additional resources for each of the ten programs. Reproducible maps and handouts are also provided.

Schools play a significant role in helping prepare our youth for effective and responsible participation in society. Today's young people--the adults of tomorrow--will soon be responsible for making informed and rational decisions about issues affecting the interactions of the world's inhabitants and the relationship of all humans to the earth. They must understand how their actions influence the lives of people living in other regions of the world and how the actions of those people affect them. They must know where and why events are occurring if they are to apply their intelligence and moral sensitivity to improving the quality of human life on this planet. They must, in short, receive a sound education in global geography. Such an education provides the perspectives, information, concepts, and skills essential to understand ourselves, our relationships to the environment that surrounds us, and our interdependence with other people in the world.

### Project Background

The **Global Geography** Project had its origin in a statewide needs assessment survey conducted in 1982 by the Wisconsin Educational Television Network (WETN). A major need identified by the survey was television programming to support geography instruction in middle and junior high schools. In February 1984 a feasibility study described the frequency, content, and approach of contemporary geography instruction and solicited teacher recommendations for the development of new programming. During the same year, WETN continued development activities under the supervision of Thomas De Rose, in association with Michael Hartoonian, Wisconsin Department of Public Instruction, and James B. Foust and Richard S. Palm of the University of Wisconsin-Eau Claire.

By the end of 1984, Mr. De Rose prepared a project concept paper and WETN invited AIT to be a funding partner through the mechanism of pre-production lease. Because of the significance of the project and the level of funding needed, it was agreed that the project required a consortium rather than a pre-production lease approach.

AIT invited Dr Alan Backler, Indiana University, Bloomington, INDIANA, to act as chief project consultant for the **Global Geography** Project. Backler (a geographer by academic training) asked Dr Joseph Stoltman, chair of the Geography Department at Western Michigan University and chair of the Commission on Geography Education of the International Geographic Union to participate in the project, as a content consultant.

In May 1985 the WETN concept paper and a statement by Alan Backler based on the paper were discussed by a group of specialists in geography, geographic education, social studies education, and instructional design.

In November 1985 AIT published **"A Prospectus for a Video Project in Global Geography for Middle and Junior High School Students."** The prospectus described the rationale of the project, its impact on geographic education, the program contents and matters related to project management, the project schedule, and project funding.

Forty-one U.S. states and Canadian provinces participated in the funding of the project. The fees were calculated on the basis of the number of students in elementary and secondary schools in a state or province. Participation gave states and provinces the right to review and evaluate the development of project materials and to transmit, duplicate, and distribute all video and print materials for education use within their jurisdictions, for a 12-year period.

Working in close cooperation with the specialist group and the consortium of participating states and provinces, the design team developed a provisional design for the project in August 1986, followed by a final design in January 1987.

This development was supported by a continuing exchange of thoughts at meetings, comments on documents such as provisional materials, program treatments and progress reports.

The broadness in expertise of the specialist group is reflected in the members' professional functions at the time they participated in the project. (See Appendix II for listing of the design team and specialist group).

**Project Design Assumptions**

Five general assumptions underlie the entire series. These assumptions and their design implications are:

1. *If new instructional materials are to be used, they must fit into the existing scope and sequence.* In 1980, Project SPAN (Social Studies/Social Science Education: Priorities, Practices, and Needs) reported on the present and future status of the social studies in the United States[1]. The report indicated that geography is most widely taught in grades 6 and 7. Therefore **Global Geography** was aimed at these grades in middle and junior high schools.

   Early adolescence (the middle school/junior high grades) holds rich potential for introducing global geography, because most children possess the cognitive and affective maturity needed to acquire an international perspective and because they have not yet erected barriers to global understanding. Appropriately designed instructional materials can take advantage of young adolescents' mental maturity and their desire to learn about the world.
2. *Effective video programs must capture the attention and interest of viewers.* In **Global Geography**, compelling case studies dealing with a situation faced by an individual or family were used as a vehicle for introducing an issue from the geographic point of view. Case studies are of particular interest to middle and junior high school students.
3. *Video programs will be used most if they reflect existing course organization.* Project SPAN also revealed that commercially published textbooks are

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[1] D. Superka, S. Hawke, and I. Morrissett, "The Current and Future Status of Social Studies," Social Education (May 1980): 362-369.

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the major resource used for teaching social studies. Therefore, an examination of geography/social studies textbooks provides a good indication of what is being taught in the schools. Most geography textbooks and courses emphasize world regions. **Global Geography** respects this approach. Each of the ten programs focuses on a world region. Within this regional emphasis, special attention is given to one of the topics typically considered in geography textbooks.

4. *The content of the programs should be consistent with current trends in geographic education*. The content of **Global Geography** is based on the five fundamental themes of geography described in the **Guidelines for Geographic Education**[1]. These themes are location, place, relationships within places, movement and regions. The themes contain the basic ideas and concepts used in global geography and will be familiar to teachers of geography at all levels. The series is also designed to develop and reinforce the geographic skills that are recommended by the **Guidelines.**
5. *Video programs are useful if they fit easily into normal classroom schedules*. Programs longer than 30 minutes generally do not allow teachers enough time to conduct pre- and post-viewing activities-important elements in instruction using video. Shorter programs are particularly appropriate for classroom use. In **Global Geography**, video programs are 15 minutes long. These assumptions suggested a general design for the video programs. The design is shown on the chart. Each program focuses on a specific **region**, with the regions selected to represent every part of the world. The division of the world into regions is current practice in geography education and reflected in most geography textbooks and courses.

**General Design**

**Region**
**Setting**
**Topic**
**Issue**
**Theme**
**Major Skill**
**Story Line**
**Comparative Examples**

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[1] Guidelines for Geographic Education (Washington, D.C.: Association of American Geographers and National Council for Geographic Education, 1984).

In each program a case study in a particular **setting** is used as the vehicle for examining an important **topic** typically presented in geography textbooks, such as land and water, trade, or food resources.

Each topic is considered in the form of an **issue**, such as dealing with natural hazards, building trade linkages, or adopting new ideas about food production. An issue was selected if it was global in nature and could appeal to students in the target audience.

The particular geographic **theme** of each program helps students understand and analyze the issue considered. At the same time, students must use important geographic **skills** to ask and answer important questions about the issue. These skills include mapping, graphing, data handling, and critical thinking. Formal procedures for teaching these skills are presented in the teacher's guide.

The **story line** of each case study focuses on an individual or a family. This type of case study appeals to students in the target audience, and also emphasizes the human dimension of geography.

In each program **comparative examples** taken from countries in other world regions develop the issue further. Each program contains one or two examples from the United States or Canada and one that is similar to that in the case study but in a different world region. Other examples ar more general, but also related to the case study.

Choosing the general content for each program involved filling in the design chart. For the Netherlands program, we knew that a program on Europe was required; it is a region covered in every geography book. Furthermore, land and water was a topic typically considered in textbooks. The Netherlands came immediately to mind as a setting.

**Netherlands Program**

| | |
|---|---|
| Region | Europe |
| Setting | The Netherlands |
| Topic | Land and Water |
| Issue | How Do People Deal with Natural Hazards? |
| Theme | Relationships Within Places |
| Major Skill | Making Inferences From Maps |
| Story Line | . A Grandfather Describes the 1953 Flood to His Granddaughter<br>. A Mother Tells Her Children About Being in the Flood When She Was Young |
| Comparative Examples | Bangladesh, Japan, Canada |

An issue was identified that connected water to The Netherlands. The geographic theme was then selected because it was an appropriate framework within which to consider the issue. The skill was selected because it allowed us to ask some intriguing questions related to the geographic theme. The general story line tied the elements of the program together, but was refined as we worked with our consultant in The Netherlands.

Several comparative examples were considered, in line with program topic. Bangladesh, Japan and Canada were ultimately selected in part, because appropriate stock footage could be located for them and because they met the criteria for comparative example selection.

### Organization of the Video Programs

A format for the program was next established by the design team. It allowed all of the design elements to be worked into a fifteen minute program. This format was approved, as was every major decision in this series, by the education agencies that formed the consortium for the project. It appears below.

| Segment | Approximate Duration | Purpose |
|---|---|---|
| 1. Introductory Material | 3 minutes | |
| Advance Organizer | 30 seconds | Highlights program issue using excerpts from case study |
| Standard Opening | 30 seconds | Continues to highlight issue using excerpts from comparative examples |
| Introduction to Issue | 1 minute | - Introduces program issue<br>- Establishes global context of issue<br>- Develops organizing question for program |
| Overview of World Region | 1 minute | Sets stage in particular region for case study |
| 2. Case Study | 7 minutes | Explores program issue using family as vehicle |
| 3. Comparative Examples | 4 minutes | -Provides further examples illustrating issue<br>-Emphasizes global nature of issue |
| 4. Ending | 30 seconds | Asks students to consider impact of the issue on the people in the program |

The establishment and approval of a standard format for the programs allowed the design team to create outlines for each program. This outline was used by the project writer to produce draft treatments for the programs. A treatment is a detailed description of what is to happen in the program.

The draft treatments were reviewed by the consortium members and by consultants. In every case study country a geographer was identified to act as a consultant and to make arrangements for shooting in that country. Henriëtte Verduin-Muller was the local consultant for The Netherlands program.

The local consultant reviewed several drafts of the program treatment (usually three) until he/she was satisfied that the treatment of the case study accurately reflected reality and could be captured on video tape.

When a treatment was given final approval by the design team and the consultant, video taping took place. It was not unusual for three to four days of continuous shooting to be required to produce a seven minute case study.

The case study was then created and all other program components: animation, graphics, stock footage, were brought together for editing. Next a narration was written and recorded. Finally, music was added to complete the video program.

The first program completed was field-tested. Results of the field test were used to revise that program and affected the development of the remaining programs.

### The Teacher's Guide

Like the design for the programs, a general design for the teacher's guide was developed early in the project. The features included reflected AIT's experience developing printed material to accompany video programs. Again the design of the guide, and a prototype version were approved by consortium members.

The teacher's guide is intended to help teachers use the video program effectively. The teacher's guide contains an introduction that presents the overall objectives and rationale for the project. There is also a lesson plan for each video program in the series.

Each lesson plan contains a description of the conceptual and thematic foundations of the video program, a summary of what appears on the screen, a glossary of key terms, and suggestions for activities before and during the program to help students understand the issues that have been introduced. In addition, each lesson in this guide includes discussion questions for use after viewing and ideas for activities with local application, so teachers can help students understand how the fundamental themes of world geography have relevance in their own communities. At the end of the guide is a section called 'Further Resources,' in which sources of supplementary readings and video materials are listed. There is also a reproducible handout--usually a map, table, or chart--to go with each lesson. Finally, a correlation matrix relates each **Global Geography** program to chapters in the geography textbooks most commonly used in middle and junior high schools.

## Conclusion

The design and development of this project followed certain defined stages. It is the author's opinion that they closely paralleled the 'rules of thumb' as formulated in the methodological section of 'Exploring the construction of geographical knowledge projects'.

It began with the establishment of certain assumptions or requirements which had implications for the design of the instructional products. The materials had to fit into the existing scope and sequence; be appealing to the target audience, reflect existing course organization; be consistent with current trends in geographic education; and fit easily into normal classroom schedules. These assumptions suggested a general design for the video programs.

During this stage a format for the programs was established that allowed all of the design elements to be worked into a fifteen-minute program. It is important to understand that every decision that was made in the project had to be approved by the consortium agencies.

With the general design determined, a second stage of development began. This can be referred to as the treatment stage. During this stage evolving documents, the program treatments, were written, reviewed and rewritten to develop guidelines for videotaping that met all of the project requirements while at the same time accurately reflected reality. The final treatment for each program was used to shoot the case study and to guide the design of graphics, animation and the selection of stock footage.

The development of the teacher's guide followed a similar route. Like the program treatment, the design for the teacher's guide was reviewed by consortium members and field-tested on a limited basis.

The final stage of development involved actually putting the videotape together and then writing the teacher's guide, using a previously established format. The first program completed was field tested and revised based on the results of the field test. These results also affected the development of the remaining programs.

### Appendix I

The Agency for Instructional Technology is a nonprofit U.S.-Canadian organization established in 1973 to strengthen education through technology. In cooperation with state and provincial agencies, AIT develops instructional materials using television and computers. AIT also acquires and distributes a wide variety of television, related print and computer materials for use as major learning resources. It makes many of these materials available in audio-visual formats. From April 1973 to July 1984, AIT was known as the Agency for Instructional Television. Its predecessor organization, National Instructional Television, was founded in 1962. AIT's main offices are in Bloomington, Indiana.

### Appendix II

#### Design Team

Chief Consultant
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Larry Walcoff, Producer AIT

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## A local consultant at work for the Global Geography Project

Henriëtte Verduin-Muller

### Introduction and context

Alan Backler, in his description of the Development and Realization of the Global Geography Project (see pp. 43-52) refers to the cooperation with local consultants. My work and experience as such a consultant will be sketched in the following pages.

The contribution concerns the Global Geography's program on 'Dealing with Natural Hazards' for which the South-West of the Netherlands, was used as an example.

The consultancy period was experienced as a continuing process of activities. To ease the reader's understanding of the successive events the chain is divided and described in six sections.

### An invitation to cooperate (April 1986)

It is good to meet occasionally old friends. So on April 29th 1986 I had en route to the annual AAG conference (American Association of Geographers) in Minneapolis/St.Paul, Minnesota, at Chicago's International Airport Hotel, a get-together with Alan Backler, also a geographer. We talked about our work, exchanged as usual ideas and experiences and swapped publications.

Then Alan began to mention the planned, worldwide, Global Geography Project, set up by AIT (Agency for Instructional Technology), Bloomington, IN. He, being the chief project consultant himself, asked me to do some consultancy work for the program 'Dealing with Natural Hazards' which was to be realised in the Netherlands and concerned the floods of 1953, and the Delta Project as the Governement's answer to the problem. Moreover he wanted my cooperation in view of my scientifical interest on the construction of knowledge products.

I agreed in principle, although at that time I was not sure what the consultancy would involve. Soon after the project administrator and a member of the design team, Larry Walcoff, turned up in the hotel lobby. Alan informed him of my willingness to do the local consultancy. Mr. Walcoff then characterised my consultancy succinctly and compact as 'to show the way and to open doors to some flood-torn families'. That was it, not much work, nothing special though. He added that the Global Geography Project should be in school for use by September 1987.

The three of us we chatted for another few minutes about the project in general, then I had to leave in order to catch the Minneapolis/St.Paul connection. In the plane my thoughts were with the Chernobil disaster, which had just happened and the possible consequences for Europe.

### Searching for a proper location (July/August 1986)

It was not until July that there was any further contact with AIT. The search for an appropriate location (if I may use these words in this context) in the South-West of the Netherlands would take some time, so I proposed to AIT that I set to work.

Reading books and reports about the 1953 flood-area and driving around in the region, the eastern part of the island Goeree/Overflakkee with the village of Oude Tonge seems a good choice for focussing on the disaster. There the physical geographical situation in respect to the sea, the weather conditions together with the network of dikes formed a good basis for an understanding of the origin of the disaster.

The disaster had an enormous impact on Oude Tonge and the surrounding landscape. Among the inhabitants, no doubt, there would be people who in 1953 were old enough to remember that awful night when the water burst into the low lying polders. But where and how to find the people who would be willing to reflect on the frightful and emotional experience.

The municipal council of Oude Tonge was approached for permission and for help. Mr. Poortvliet, alderman, born and grown up on the island, assited where and when possible. Being fully familiar with the physical, socio-economic and human characteristics of Oude Tonge, he was also willing to contact families who might be interviewed about the disaster.

Together after a first contact by Mr. Poortvliet, we visited, some families to ask them to share their painful memories of February 1st 1953 for the sake of the Global Geography Project Program on Dealing with Hazards.

Two families agreed to talk more fully about their experiences. The approach was one of great prudence, because deep human emotions were involved.

**Working contacts with the design team (August/September 1986)**
At the end of August '86 there was, as a result of my attending the regional IGU conference (International Geographical Union) in Sitges/Barcelona Spain, a further personal and working contact with two members of the design team (Larry Walcoff and Jo Stoltman).
This unique situation was used to discuss aspects of the Global Geography Project's program Dealing with Natural Hazards such as, the reasons for the chosen location in the Delta region, the cooperation of the authorities and the willingness of two families to be interviewed. Relating physical and human geographical data and maps concerning the location were discussed. The financial aspects were delimited.
The team members brought a first draft treatment of the video program on hazards for reading and discussion. Because the structure of the program was given and the content, a product of deliberation between the project's geographical consultants and a capable writer, my comment for the draft treatment remained restricted. My notes concerned the specific geographical circumstances of the 1953 floods and the regional setting.

At the Sitges/Barcelona get-together it was further decided that within a week or two the design team member, Larry Walcoff, would come to the Netherlands, to visit the region and to meet the local authorities and the families to be interviewed. Thus an overwiew of the different aspects could be gained. Also the person in control of the video shooting group (of Studio Hamburg) would be there.
AIT had a special arrangement with the NDR (North German Radio). This German Radio/TV station was to broadcast in November/December '87 the Global Geography Project in its school tv. series, therefore the actual shooting should be done by a German group. The editing, of course, being the concern of AIT, Bloomington, IN.

So after returning to the Netherlands, appointments were made to fulfil what had been agreed at Sitges/Barcelona. And indeed the intended activities were realised between September 7 and 11.
Moreover Larry Walcoff took many stills of the landscape, the villages, the families involved and of book and magazine pictures brought together by the local authorities showing the flood disaster. At the Delta exposition in the region, several documentaries on the flood and the closing of the

sea-arms were viewed. This was not only to be informed and to get more involved with the events, but also to select shots to mount into the video program to make.

During these few days the three of us stayed in an hotel in Middelharnis, situated in the centre of the island. It was an excellent opportunity to learn to know each other in discussing the video program under construction and since Mr. Poortvliet, representing the local authorities, was often with us, I can vouch that a much involved working group developed.

### The final scenario (October 1986)

After the visit on location, the consultancy activities had to develop steadily. At my temporarily address in the US, in October '86, I received the text of the final draft treatment of the program for discussion. A definite agreement with the full design team needed to be made soon. The method of the hazards program, was to be a model for the procedures to follow with the other Global Geography Project programs. Because the members of the design team where at that time scattered over the US the final deliberation was done by tele-conference. The remarks for this final draft concerned the emphasis on a few phenomena within the given context, remarks typical to expect from a geographer well familiar with the subject and the geography of the situation.

### Designing and scripting the dialogues of the flood night of 1st February 1953 (November '86/February '87)

It took quite some time to organize, write and agree the dialogues about that calamitous flood night of February 1 1953 within each of the two families. Talking about those 1953 experiences in 1986 was, even after 33 years, a retrospect not easy to discuss. I felt grateful that the rapport with the families became, in the course of time and during repeated get-togethers, more intimate. On the basis of the information thus gained, I put on paper a proposal for the dialogues in their spatial context: a two-person dialogue, for Mr. Knöps and his grand'daughter Anke de Korte, and a three person dialogue for Mrs. Human-Kik and son André and daughter Rianne. The proposals were discussed in a friendly manner to fit in with content and infrastructure.

Early February '87 the final versions of the dialogues, translated in English, were sent to AIG, Bloomington, IN. The members of the design team agreed the scripts. The dialogues on location were to be done in Dutch, whereas in the final product a narration in English was superimposed, the Dutch to be heard in the background.

**Shooting on location**

All the preparations being made, the shooting was planned in March '87. An uncertain factor remained the weather which could vary markedly at that time of the year. Risky, but nevertheless, March was the ultimate shooting period, to keep the program in accordance with AIT's general schedule for the project. Thus Larry Walcoff had, with his long experience as a filmmaker, taken the position as a producer, together with the German shooting team, the local authorities, the cooperating families and myself were in harness for four days on location in the Delta region. The weather showed its normal instability, but all together did not prevent shooting.

All activities proceeded as planned and arranged. As usual some shots and scenes had to be done several times. Moreover, thanks to the shooting by video it was possible to play back the results immediately, consequently the decision to retake shot could follow on location. The videobus of the Hamburg studio team was well equipped for this type of work.

After some days of close cooperation the group felt good about the collected raw material, looking forward to the final product with confidence.

The final selection of all the material: shootings, stills and documentary film scenes followed along the embedded structure (see process description of Alan Backler) at AIT, Bloomington, IN., during the summer of 1987 and in close communication with the design team.

The consultancy had come to an end. The initial designation as 'showing the way and opening doors to some flood-torn families' and 'not much work, nothing special' appears in practice to be a set of very demanding activities.

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## 4.3 Recalling a process: developing People and Environments

Frances Slater

Developing **People and Environments** began with an invitation from a commissioning editor at Collins Educational to join her at lunch. A conventional beginning.

We were to discuss the possibility of my writing a new 'A' Level text, that is a text for those studying geography in the last two years of schooling in the British system.

### Competition and the Market

The commissioning editor was aware of a new and innovative 16-19 geography curriculum developed over a number of years by some of my colleagues at the University of London Institute of Education. The project was the last of three geography curriculum projects sponsored by the now abolished Schools Council. The commissioning editor saw a gap in the market. There were no text books available specifically catering to Geography 16-19 approaches. The project itself was publishing through Longmans a series of booklets based on the syllabus themes and topics. The Collins commissioning editor, J.P., judged that a single book, rather than a series of booklets would sell better, be seen as a better buy in teachers' eyes than booklets. That is what I recall of the state of the market and the competition as it was discussed briefly with me.

Over lunch, I persuaded J. that I did not have the time or the detailed knowledge to write such a text but that I could put something together as an editor. It was also decided that since it was early days in the take-up of the Geography 16-19 syllabus, we would not follow its themes and topics only or completely.

An analysis of other 'A' Level geography syllabuses was soon undertaken by J. if I remember correctly, and a general list of topics drawn up.

### A Challenge

But I run ahead in my story telling. Lunch was not yet over. I had met my hostess first, when she was working for Heinemann Educational Books and she had seen my lesson planning book **Learning through Geography** through the press. As I recall it, J. posed a challenge, that lunchtime, like this: 'could I produce a text which would live up to my ideas in **Learning through Geography**?' I remember feeling somewhat attacked. I accepted the challenge not so much because of my book but because I could remember how I taught in classrooms, how I tried to make knowledge accessible to adolescents and because it seemed to me that text books could be full of activities (not just quesions) to assist learning. They need not, in other words, to be full of text only.

I think there were other thoughts in the background which led to my saying 'yes'. I knew that working on such a text would not carry any weight for further promotion in my university. School texts do not count although ironically my job is to train teachers. Against this, somewhere I was thinking that here was a chance to set out actual examples of what I considered to be helpful and interesting learning experiences. I would have a resource to refer my students to. I would be able to say 'you don't see me teaching sixth forms, but here's what I mean when we talk about taking kids through knowledge so that is does not remain something out there, on a sheet of paper, but something they engage with, travel through, meet, shake hands with, chum up with'.

In the introduction to **People and Environments** I put it like this to the students:

> 'After the chapters in **People and Environments** had been decided on, to illustrate the five main themes and to fill out the detail of 'North and South', a good deal of attention was paid to setting up activities and exercises which would help you to work through and understand the ideas presented by each author. That is the purpose of all the activities - to give you an opportunity to go over the text again, to think for a second, third or fourth time about what is being said, to analyse the main points, and to confront the values and attitudes underlying and fuelling the patterns being described and the decisions being taken. In working through the activities and exercises, you will be developing your knowledge of world issues and your capacity to think about and analyse ideas and make connections between one set of ideas and another. You will also be increasing your ability to problem solve, and to follow through an investigation in a scientific way. The many letter-writing, speech-making, and explaining-to-

> another-person type tasks, will develop your awareness of the way attitudes, opinions, prejudices and values colour and condition many of our decisions, as well as helping you to work over the ideas and think about them for yourself. Role plays, simulations, debates and conversations are a good way of showing how vested interests operate and contribute to the way our world is patterned.'

I am, however, moving away in that quotation from the history and process of making the **text** to attitudes and beliefs which I have about teaching and learning, to my views on how necessary it is for teachers to facilitate, to find ways of getting learners to engage with the text, the content, so that it begins to mean something to them. Nevertheless, this point relates closely also to the structuring of the text as a knowledge product. It is a product which has to be engaging from a learning point of view.

Perhaps, however, we better return to history again. At the end of lunch, we had agreed on a multi-authored text, fairly generally in sympathy with the spirit and purpose of Geography 16-19 as competition for the Longmans booklets. J. drafted, after conversation together, guidelines to potential authors which explained the overall purpose, the Geography 16-19 philosophy, the people-environment framework, the length of chapters and so on.

I went away to think about possible authors and issues for the book and eventually to write and talk to authors more about issue based approaches and activities. I recall this process of selection as a very haphazard one. What I really think I mean is that I didn't follow any one source of ideas rigidly. Lots of possibilities occurred to me. By possibilities, I mean reasons and justifications, that is, for the choice of authors and issues.

### An Idiosyncratic Choice

For example, I had always thought it is a great shame that John Maunder's work on the value of weather had never seeped into 'A' Level geography in Britain. He lives and works mainly in New Zealand and ideas tend only to flow from the so-called centre to periphery and not the other way - a comment on the strength of old, imperial patterns. Yet the idea of the value of weather and the cost of weather events was so compatible with a people-environment approach. It gave a new slant on weather with some, though not a burdensome amount of meteorology - not a popular topic with geography teachers in England. The meteorology was directly related to an actual event.

The chapter by Maunder is probably the least close to English teachers' knowledge and training in the whole book though close to the spirit of Geography 16-19 and its framework. It was probably the most idiosyncratic choice I made and therefore I remember it, to recount it here. It was close to my experience, however, since I was taught by Maunder at the University of Otago (N-Z).

### The Problem of Selection

I was obviously influenced in my choices by geographers I knew or who were known to J.. What dimensions for selection and choice did I seem to be working in most often? I had long agreed with a statement I associate with Michael Storm, namely, that a two fold division of the world into North and South probably supercedes any others today. I was, therefore, very conscious of trying to obtain a balance of issues to do with the developed and developing world. The Communist world figured strongly in my thinking too.

Unfortunately, an author on Soviet agriculture dropped out, unable to cope with the idea of providing an issue based text. I did not find it easy to find specialists in the Soviet Union and Eastern Europe who were willing to write.

I also see the world today, as ever, I suppose, structured in terms of urban environments and rural environments. If one thinks about this more then we get a full range of topics to do with people, cities, problems and movements of people and topics to do with agriculture and food production in North and South. The radical geography movement of the sixtes and seventies had alerted me, persuaded me, of the necessity for becoming a little less naive and seeing more strongly the government policies and exercise of power and vested interests in agricultural topics, hence the thematic heading for People and Environment's Part II, 'Power, policies and food production'. Whose interests are policies serving? In whose interests is power being exercised?

If one thinks of urban-rural and North/South dimensions then somehow it comes to make sense to address industry in both North and South. Another facet of North/South and industry is regional planning, development plans and the whole notion of alternative approaches to development. What was also at the back of my mind was that other dimension of geography which is not systematic but area based, i.e. regional.

As I say, the process of selection as I recall it felt like choices from a number of influences. The choices derived from a scattering of ideas and predilections based on years of experience in geography. Linked to this was a knowledge of the kind of topics widely taught in English schools and often related to frequently occurring news items. I should think that the contents in general reflected a fairly 'received', conventional view of geography. They are also a selection compatible with my belief that studying geography illuminates our understanding of the patterns and processes characterising the world today. If we arranged such a selection of topics into a text eventually appearing as **People and Environments**, then it somehow squared with my idea of significant topics for understanding what it is like, what is happening out there in the world. I suppose I am saying that I selected as much from **my** experience and **my** geography as from geography as it exists out there as a formal subject - yet the two cannot be so far apart. The book is not an unusual one in terms of topics or issues covered and nor would it have been published if that were so. I worked from my articulated experiences and I linked that with other opportunities and constraints.

**Across the Continents**
An important dimension which I should not forget within which I considered topics and issues is the continental and/or culture region one. I do remember being very conscious of trying to get a spread of issues across the continents.

It is interesting that analysed by a continental label, the spread is:

| | | |
|---|---|---|
| Europe including UK | 6 | (including two British based physical environment chapters) |
| Asia | 4 | |
| North America | 3 | |
| Latin America | 4 | |
| Africa | 4 | |
| Australia/NZ | 1 | |

Over or under representation of areas is not severe. The most significant gap is the USSR and Eastern Europe. As with USSR agriculture, an author on Polish industry failed to produce a chapter and was not replaced.

Analysed by issues, I think there is a fair spread though that is open more to debate. Studying the demographic transition is for some reason much featured in 'A' Level geography and through discussion with my authors for the first chapter (J.A. Verduin and H.S. Verduin-Muller) we were able to use this as an introduction for important issues today to do with the reactions to declining birth rates and the ageing populations of Europe. There are other chapters which cover frequently taught topics - the shanty town and self-help housing is one, the drainage basin another, Brazil another. I should emphasize that I was fully in tune with and in support of the Geography 16-19 issue based stance. An issue based perspective is a powerful mechanism for selecting content: what are the issues there or here? It seemed to me, for example, that a knowledge and understanding of European population trends, food over-production policies and industrial changes gave someone a fair understanding of processes then currently significant in Western Europe. They come up frequently in news items and they illustrate the exercise of power and the role of priorities and value systems. Similarly, I think that the issues in the book illustrating Latin American geography, give students a reasonable feel for that culture area - its long standing problems, e.g. land tenure linked to power games and its more recent difficulties to do with rural/urban migration and development policies. An issue based approach is not a regional geography but it can give a good understanding of regions and the processes dominant in them.

**Learning Experiences**

If I have now established within this story a sense of the process of selection of content, more needs to be said about the nature of the learning experiences which are interwoven with the text.

First, it can be said that as a learning experience the book presents author text, graphs, statistics, photographs, maps and most innovatively newspaper and magazine articles on the topics. A variety of ways of presenting knowledge in texts is not new; rather less frequently used are extracts from other texts, newspapers etc. This is just, as I see it, one way of linking with the 'real' world if we accept author text as least 'real' world to most of us. The headlines and style of newspaper articles, for example, differ from the conventional text style. So we have information presented in a different form for the students. I believe this assists accessibility.

Second, as a learning experience, the exercises or activities, call them what you will, form as I see it, a bridge between teacher and learner, between text and student. The activities, some written by authors, some by me as editor, are the intervening variables, the facilitating factors between the text laid out, understood by the authors and the text to be understood by the student. They are a meeting ground. To me, this provision of meeting grounds is the aspect of the book where I think up to its publication date in 1986, we went further than before in the UK. We went further in an attempt to help students encounter a text. The activities are certainly the element of the book I rate most highly though teachers in their comments to me indicate they rate its resource richness as highly.

I shall continue to see the book as distinctive for its 'conversations', its dilemmas, its role plays, its audience related exercises, (as in write a newspaper article, a memo to the President, explain to a 12-year old etc), discussions around a cartoon, humanistic exercises, ranking exercises and so on. As I see it, through such activities to engage the mind, knowledge is constructed afresh by a new generation in a purpose-given, context-rich setting. These activities/exercises stand as attempts to help learners learn. They are the pivot of the book to me as I see the process of putting it all together for learning through geography.

I started telling a story about the development of a textbook. Within that development my enthusiasm for finding ways of initiating students into areas of knowledge and my beliefs, some grounded in theory (for a further elaboration see Robson, 1983, Slater, 1984, Slater (ed.), Routledge, 1989), about how to assist this learning influences the structure of the book.

There is much in the history which has not been told. I have no files to refer to. I should however briefly mention the skill and experience which the publishers provided in designing the layout. They succeeded in producing a new look geography text. One or two difficulties arose although in the main J.P.'s perception of the book and my own and the effort we were prepared to put into it ran together smoothly.
A major difficulty concerned the chapter on nuclear power. The publishers felt the author was providing an anti-nuclear chapter. I disagreed. I argued there was so much material about which is pro nuclear that to have the anti-nuclear case there may have been unusual but not biased. The chapter was however far too long and exceeded its word limit by at least two and one half times. The author refused to make amendements. Finally, J.P. shortened and to some extent restructured the chapter. She wanted what she considered a more balanced chapter. Significantly, after Chernobyl the publisher said to me 'Oh we should have put in more of the anti-nuclear view, afterall'. I certainly formed the impression during the time I worked on **People and Environments** that publishers are powerful defenders of the status quo.

In this essay, I have recognized Verduin-Muller's rules of thumb even as I tell a story. The first rule of thumb directs attention to requirements. The state of the market, the then current A level syllabuses, the new geography 16-19 syllabus and my views and those of the publisher of geography in education were all relevant variables. Then my comments on choice of authors and the influence of radical and indeed humanistic geographical paradigms touch on the second rule of thumb. The selection of content, its conception and structuring was something that authors and editor were involved with at many levels. The issue based approach, the attention to North/South divisions and an attempted balance across cultures and regions all affected the selection of content. In addition, the attempt to achieve an enquiry perspective in each chapter, influenced the structure of the content.

The fourth rule of thumb, realizing the script, is addressed in reference to the design expertise of the publisher but I believe the attention to exercises and activities and the significance I place on this aspect is again relevant at this stage in the process of developing **People and Environments**. The inclusion of resources (texts) other than author written text and the reasons for this have been stressed above and contribute to understanding the process of development and reveal the elements of that fourth rule of thumb also.

Models and rules of thumb were not necessarily explicit to my mode of operation as we developed the text. I lost a classroom in going into teacher education, I might say. I found another classroom in working to make **People and Environments** a learning experience for those who have some desire to learn about the world as geographers see it and interpret it.

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## 4.4 Whaling in the Golden Age of the Netherlands: the construction of an exhibition

Louwrens Hacquebord and Wim Vroom

### Introduction

In 1979, 1980 and 1981 archaeological research was done in the northwest corner of the Spitsbergen archipelago. Parts of a Dutch whaling settlement which was called Smeerenburg were excavated in order to gain more insight into the activities of the whalers on the west coast of Spitsbergen, the structure of their settlements and the impact of their activities on the natural environment. Attention also was given to the adaptations of the whalers to Arctic conditions. Questions as to where and how did the whalers built their tryworks, and especially why did they abandon their stations in the fifties of the seventeenth century were asked. To answer these questions both historical and archaeological research was done.

In addition to this research several other studies were carried out also. So geographical, botanical, palaeo-botanical and climatological research was done in order to obtain more information about the arctic environment in general and the local environment in particular. Therefore the project became more and more multi-disciplinary, producing a great deal of knowledge about the seventeenth century whaling trade in the Spitsbergen region.

However, besides information, the excavations produced a great number of objects which were very well preserved thanks to the local environmental circumstances. During the three seasons of fieldwork we became so impressed by the results of the excavations and by the Arctic environment that a plan was conceived to set up an exhibition in which the results of the project were combined with the impressions we got in the field. We wanted to give the visitor to the exhibition the feeling that he had been there himself and also we wanted to give as much information as possible. Because the department of history of the Netherlands of the Rijksmuseum in Amsterdam, was involved in the project from the beginning, this museum was the obvious location of this exhibition.

### The historical content of the exhibition

The first whaling voyages took place in 1611, 1612 and 1613. The whaling trade in those first years had an incidental character at least in the Netherlands. Some important Amsterdam merchants tried this new investment possibility, but in the first two years they were not very successful because of lack of knowledge of whaling techniques and because of competition from English whalers. The incidental character of these whaling attempts was shown by the temporary nature of the first whaling stations on the Spitsbergen coast. Wherever possible and always near the place where the whale was killed, temporary arrangements were made for trying out the whale oil.

In 1614 a number of Dutch merchants, after the example of the Dutch East India Company, set up a whaling company, which in Dutch was called the Noordsche Compagnie. They applied for and received a charter from the Dutch administration. Every important port in the Netherlands had an independent whaling enterprise (called in Dutch chamber) within this whaling company. In this way a cartel of whaling enterprises was formed and agreements were made fixing catches and prices, so that the Dutch whaling trade became a reasonably well organised enterprise. The company's fleet was protected against competitors from other nations by several men of war, and Basque harpooners were hired to make up for the Dutchmen's lack of knowledge of whaling.

The company existed from 1614 to 1642 and every year several ships were fitted out for the Northern Ice Sea. This fleet was divided into two parts, one for Jan Mayen (71° N.) and one for Spitsbergen (79 °N) (see figure 1). On Jan Mayen several Dutch whaling stations were establishd. The greatest number on the west coast of the island, on the sandy beach of the North Bay. At first, several whaling stations were established in various places on the west coast of Spitsbergen as well. But in the twenties of the seventeenth century, when Dutch whaling activities became concentrated in the north-west part of the Spitsbergen archipelago, a settlement, composed of seven independent whaling stations, came into existence on the south-east spit of Amsterdam Island. In this settlement in the sixteen-thirties, the Dutch whalers tried to winter twice. The first time (1633-1634) the whalers, survived the polar winter but the next year all winterers died before the ships returned. These winterers however were not the only victims of the whaling trade. In the neighbourhood of the settlement cemeteries were found with hundreds of graves, where the dead were buried until well into the 18th century.

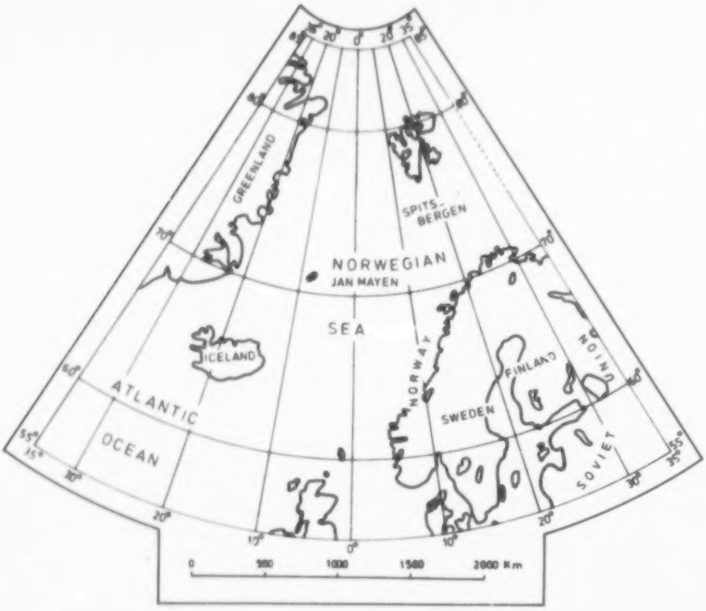
GREENLAND
SPITS-BERGEN
NORWEGIAN
JAN MAYEN
SEA
ICELAND
ATLANTIC
OCEAN
NORWAY
SWEDEN
FINLAND
SOVIET
UNION
0
500
1000
1500
2000 Km

*Figure 1* The location of Jan Mayen and Spitsbergen

In 1642 the charter of the Noordsche Compagnie was not renewed and whaling became accessible for every Dutch entrepreneur. The number of ships increased, the bays of Spitsbergen became busy and many new whaling stations were established on the shores of the arctic islands. This development threw whaling into disorder and caused many disputes between the whalers. When the climate changed too the whaling stations were abandoned one by one.

In this period the blubber was stripped off the killed whale alongside the ship, and because the bays of Spitsbergen were covered with ice much longer, the working season in Smeerenburg and the other stations became too short to render all the blubber on land. So the blubber was kept in barrels and the trying out was done in the home ports of the whalers (e.g.

Harlingen, Zaandam, Twiske, De Rijp, Marken en Rotterdam (Feyenoord).

Because there were no more controls Dutch whaling reached its highest output from 1680 to 1730. In this period, an average number of two hundred ships a year were fitted out for the arctic regions and more then 10,000 men were involved in the Dutch whaling trade.

### The first concept

The first idea of an exhibition based on the results of the research project supplied for an exhibition with seven themes namely:

| | |
|---|---|
| 1 Whales | Biological and ecological aspects of the Greenland Right whale known from the records. |
| 2 The location of the hunting grounds | The geographical position of Spitsbergen and Jan Mayen. The discovery and surveying of the coasts of these arctic islands in the seventeenth century. |
| 3 The historical context | Social-economical circumstances in the Netherlands during the Republic. The Noordsche Compagnie. |
| 4 The settlements | The results of the excavations and the reconstruction based on these results. Functional differences between the objects found. |
| 5 Foreign people in the arctic | Behaviour-pattern, clothes, feeding and housing, wintering attempts and adaptation processes. |
| 6 The consequences of their sojourn | Plants, annimals and man. Death-causes, health and age etc. indicated by the skeleton-remains excavated. |
| 7 The natural changes | Adaptation by changing the conduct of business and finally abandonment of the whaling stations. |

Mainly with the use of excavated material which should be on exhibition in the framework of a whaling station and in combination with written and printed sources it should be possible to create a picture of the whaling trade in the Golden Age. To stress the importance of the whale in the whole history, a life-sized whale should be present in the exhibition. This model in combination with preserved zoological material should give a clear picture of this nearly exterminated animal.

These ideas were discussed in a multi disciplinairy working group of twelve specialists, specially established for this exhibition (see appendix). Some of them were involved in the research project already and others were specialists in the fields needed for the exhibition like arctic cartography, archive-research, architecture and whale zoology. The first task of the specialist group was to structure and conceptualize the content of the exhibition which had to result in the scenario of the exhibition. The second task was to write a cataloque for the exhibition. By establishing this specialist group the availability of expertise was secured. Three members of the specialist group were asked to do the executive part of the preparations. This executive committee consisted of two staffmembers of the Rijksmuseum (Drs. J. Braat and Dr W.H. Vroom) and one of the Arctic Centre (Dr L. Hacquebord) but soon Hacquebord and Vroom were in charge of the management of the exhibition.

When special information was needed, students were appointed to collect the wanted information. When for instance more information was needed about the availability of iconographical material, a student was hired to make an inventory of the iconographical source material concerning the seventeenth century whaling.

On the first meeting of the specialist group it was decided that every member of the group should write down his or her ideas about the exhibition seen from a mono disciplinary point of view. Contributions of the textile-, the cartographical, the diet-, and the archive-expert as well as the architect were subject to discussion within the group. Based on these contributions and earlier discussions, one of the members of the executive committee made a preliminary scenario. This **preliminary scenario** had five theme's:

| | |
|---|---|
| 1 The historical framework | The geographical knowledge of the Arctic in the Netherlands at the beginning of the seventeenth century and the level of business organization in the Netherlands. |
| 2 Spitsbergen | The geographical position and the climatological circumstances, the position of the edge of the pack ice, arctic plants and animals. |
| 3 Dutch activities and life in Northwest-Spitsbergen | Whaling technique in arctic regions.<br>Ovens and houses in Smeerenburg, structure of the settlement, exhibition of |

| | |
|---|---|
| | the excavated objects within the framework of a (partly) reconstructed house. Work, life and death in Smeerenburg. |
| 4 A look inside the research project | Discussion about the research-strategies and methods. Why archaeological research in a period which is so well documentated. |
| 5 Epilogue | The development of the cartography of Spitsbergen from 1600 until now. The disappearance of the original (Dutch) placenames of the archipelago. |

The suggestions of the specialists as well as the preliminary scenario were discussed in the group. Many suggestions were found very useful and were included into the scenario. The conclusion about the preliminary scenario was that the subject of the exhibition was still too broad and should be more limited. This was not only because of the available accommodation but also because of the limited existing knowledge of the general public. Because of the visitors' lack of knowledge of the history and geography of Spitsbergen, too much would have to be explained and that would make the exhibition too complex and that is just what we did not want. The subject had just to be simplified and explained by reconstructions, models, visual and audiovisual means to let the visitor really experience the seventeenth century Dutch whaling activities in the Northern Ice Sea. Although it required much space, reconstructions had to be tried but it is absolutely necessary to avoid a feeling of being in a fun fair. Beside this, according to the opinion of the specialist group there had to be a very strict division between the excavated and non-excavated objects as there is between original, imitation or reconstructed objects.

It will be clear that in such a concept there was no place for information about strategies and methods used during the research.

**The interim scenario**

Based on the suggestions and the remarks on the preliminary scenario put forward by the members of the specialist group and for practical reasons, it was decided to divide the interim scenario into three separated units: one unit with general historical and geographical information, one about the industrial process and one about daily life and ecology. With this geography the exhibition should have a clear historical and archaeological part. To limit it the exhibition was focussed on the activities of whalers in the hunting area during the Golden Age, that is to say from 1612 until about 1700. It had to deal with the situation in the arctic region more then with that in the homeland.

The interim scenario was:

1. An introduction to the whaling trade in the Golden Age in the Netherlands. In this part of the exhibition the visitor should be confronted with the documentation about the most important themes of the exhibition. This documentation is composed of written, printed, iconographical and cartographical sources, originating from archives, libraries and museums. Themes as the historical framework (voyages of discovery, cartography, economic developments in whaling, the organisation of the trade and the role of the notary), whaling (iconography and a videoclip about whaling techniques) and the whale (bones and baleen products preserved in Dutch museums) will be seen. With this information, the visitor will be able to understand the two following sections of the exhibition where excavated objects and some reconstructions of Spitsbergen life will be shown.
2. Reconstruction of a whaling station on Spitsbergen. An oven with choppingtable and coolingbox should be reconstructed here together with the frontpart of two houses on a scale of 1:1. Beside this, whaling equipment (both original and imitation), the tools of the blacksmith, carpenter and cooper and architectural objects should be shown. In this room attention should be given to the technical aspects of the industrial process.
3. Daily life in Smeerenburg and ecology. In this part of the exhibition the effects of the hard climate on the season workers of Smeerenburg and the influence of these first industrial activities on the natural environment should be shown. Life and death will be expressed by exhibited domestic utensils, shoes, clothes and the reconstruction of a cemetery with graves containing skeletons completely dressed against a background of the Spitsbergen scenery created by a photographical reconstruction.

This interim scenario was discussed again in the specialist group and changed on some minor points. It was a general feeling that this scenario was a big step in the direction of the final scenario. However, the final scenario depended on the possibilities of expressing the thoughts formulated in the interim scenario. The executive committee was asked to explore these possibilities.

In the meantime the specialist group was working on his second task, namely to realize the publication of the catalogue. This book had to be a scientific book for the general public with a number of essays about separate theme's. The sequence of these theme's had to be the same as that of the exhibition. For budget reasons the publication of the catalogue was given to a private publishing firm[1].

During its next meeting the specialist group agreed on the interim scenario. It was decided to reconstruct an oven with choppingtables and coolingbox and if possible the front part of two houses, scale 1:1. This, in combination with a model of the complete settlement on a scale 1:250 and the excavated objects had to give a good impression of the working situation in Smeerenburg. It also was decided to make as soon as possible a complete list of objects which should be used for the exhibition. The executive committee reported on the first results of the exploration of the means to realize the proposed scenario and from then on the members of the specialist group would be approached individualy; for some time to come no plenary meetings were planned.

## The operational phase

The cooperation between the Rijksmuseum and the Arctic Centre of the University, Groningen, was formalized and the responsibilities of the members of the executive committee were decided. The educational department of the Rijksmuseum was enlisted to write and to design the texts of the exhibition with the use of the information received from the scholars of the specialist-group.

Beside all this, the executive committee had to settle some practical things in more detail:

1. An attempt should be made to get a three dimensional life-size whale in

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[1] Louwrens Hacquebord, Wim Vroom (ed.), (1988) Walvisvaart in de Gouden Eeuw. Opgravingen in Spitsbergen (Whaling in the Golden Age. Excavations in Spitsbergen). Amsterdam: De Bataafsche Leeuw.

the exhibition to show the visitors how large the catch of the whalers realy was. Two artists were asked to make a design and an estimate of the cost. When it turned out to be too large, too heavy and too expensive it was decided to use a two dimensional picture of a life-size whale on one of the walls. It was drawn by Rob van Assen, a designer from the Museon in The Hague and photographically blown up to a life-size picture of 15 metres.

2. The reconstruction of the whaling station should be worked out in more details. This was possible with the drawings the architect made from the iconographical and archaeological information. However it turned out to be very expensive and only possible when the building contractor said he was willing to sponsor this aspect of the exhibition.
3. The photographical reconstruction of the scenery of the cemetery turned out to be possible with a multiple screen projection. This multivision was made with the use of slides of the professional photographer of the expeditions (Ben Bekooy) by a multiple screen specialist (Studio Reinier Gerritsen, Amsterdam). It had eight screens (12 metres) with changing pictures of the coast of Spitsbergen and was supported by the noise of the sea and wind. However, design and elucidation of the multivision had to be in full accordance with the special demands of the textile (not more then 50 lux). It had to be integrated within the reconstructed cemetery and in full harmony with the rest of the exhibition.

All things turned out to be possible and the definitive scenario and the exhibition plan in which every detail was settled could be made. The **definitive scenario** was:

1. Historical context of the whalingtrade.

   The cartography of Spitsbergen, to begin with the map of the world of Mercator anno 1569 to the detailed manuscriptmaps of bays of Spitsbergen from around 1720.

   Whaling in records, official papers of the Noordsche Compagnie, regulations, freightcontracts, notary's declarations and inventories of whaling stations and whaling ships.

   Whaling in logbooks, whaling in pictures and paintings, whalingships, whaling products and whaling technique shown on a videoclip.
2. The whale as animal.

   A Greenland Rightwhale in his ecosystem shown on a videoclip, the anatomy of the whale, whalebones, whalebaleen and a life-size painted model. In sector 1 and 2 only non-excavated objects and reconstructions were shown.

3. Working on Spitsbergen.
   Reconstruction of an oven with choppingtable and coolingbox and the frontpart of two houses with pavements, scale 1:1. A small model of the whole settlement and archaeological finds from Spitsbergen.
4. Life and death on Spitsbergen.
   Foodremains, domestic utensils, clothes and shoes to show one side of the life in the settlement and skeleton parts with traces of diseases to show the other side. Finally a reconstruction of a cemetery with graves filled with completely dressed skeletons as they were found against a background of the Spitsbergen scenery made through a multivision. In the sector 3 and 4 only excavated objects were shown.

With the finishing of the scenario the operational phase finally started. In this phase, which was about seven months before the opening of the exhibition, an internal working group of the Rijksmuseum together with the executative committee, took over the organisation.

## Epilogue

Realizing the scenario was not difficult anymore because everything was decided in the exhibition plan. This plan was made so detailed that even the arrangement of the objects in the showcases was indicated. All together there were six meetings of the specialist group and also six meetings of the internal Rijksmuseum-group necessary to organize this exhibition. However, two members of the executive committee worked almost twelve months continuously to realize this exhibition. Therefore it was a great satisfaction to read the very possitive reviews and to hear that 55,000 visitors came to see the exhibition.
The working scheme of the exhibition is visualized in figure 2. It could seen as a manifestation of the rules of thumb.

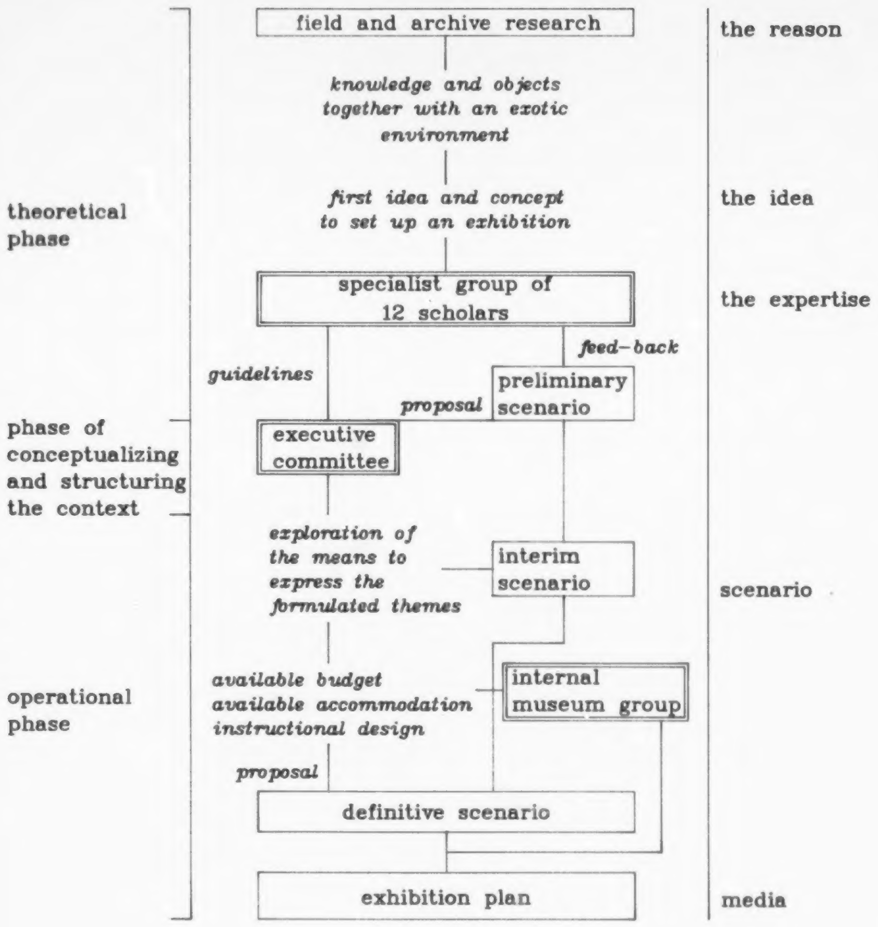
field and archive research
the reason
knowledge and objects together with an exotic environment
theoretical phase
first idea and concept to set up an exhibition
the idea
specialist group of 12 scholars
the expertise
feed-back
guidelines
preliminary scenario
proposal
phase of conceptualizing and structuring the context
executive committee
exploration of the means to express the formulated themes
interim scenario
scenario
operational phase
available budget
available accommodation
instructional design
internal museum group
proposal
definitive scenario
exhibition plan
media

*Figure 2* The working scheme of the exhibition
'Whaling in the Golden Age of the Netherlands'

**Acknowledgements**
The fieldwork which formed the basis of the exhibition Whaling in the Golden Age was sponsored by the tent and outdoor equipment firm Carl Denig in Amsterdam and the exhibition was sponsored by the building-contracting firm Hillen & Roosen, Bouw BV, Amsterdam.

## Appendix

Group of Specialists for the exhibition Whaling in the Golden Age, Rijksmuseum Amsterdam.

| | |
|---|---|
| Mrs. A.I. Bosma | Curator of the Amsterdam Municipal Archive. |
| Drs. J. Braat | Curator of the department Dutch History of the Rijksmuseum Amsterdam. |
| Dr. P.J.H. van Bree | Associate Professor in Zoölogy, University of Amsterdam. |
| Mr. O. Goubitz | Specialist in leather and leatherobjects, State Service for Archaeological Investigations in Amersfoort. |
| Dr. L. Hacquebord | Associate Professor in Historical-Archaeology, University, Groningen. |
| Dr. G.J.R. Maat | Associate Professor in Anatomy and Embryology, University, Leiden. |
| Mr. W.J. Mulder | Specialist in Anatomy and Embryology, University, Leiden. |
| Dr. J.P. Pals | Senior Research Scholar in Archaeo-Botany, University of Amsterdam. |
| Dr. G.G. Schilder | Professor in Historical-Cartography, University, Utrecht. |
| Drs. S.Y. Vons-Comis | Specialist in Textile, University of Groningen and Rijksmuseum Amsterdam. |
| Dr. W.H. Vroom | Director of the department Dutch History of the Rijksmuseum Amsterdam. |
| Dr. L.H. van Wijngaarden-Bakker. | Associate Professor in Archaeology, Zoölogy University of Amsterdam. |
| Mr. H.J. Zantkuyl | Architect and Staffmember of the Amsterdam Service for Historical Monuments. |

**Louwrens Hacquebord**
Born in Dokkum, The Netherlands in 1947. Studied physical geography, prehistory and historical geography at Utrecht University, 1976.
Ph.D. thesis: 'Smeerenburg. Het verblijf van Nederlandse walvisvaarders op de westkust van Spitsbergen in de zeventiende eeuw' (Smeerenburg. The Sojourn of Dutch Whalers on the West Coast of Spitsbergen in the Seventeenth Century), University of Amsterdam, 1984.
Refrendary at the Council of Nature Conservation of the Ministery of Culture, Recreation and Social Work, 1976-1979. From 1979 on scholar and since 1985 associate-professor in Artic Studies at Groningen University.

**Wim H. Vroom**
Born in Amsterdam, The Netherlands, in 1930. Studied economics, economic history and history of arts at the University of Amsterdam, M.A. 1956.
Ph.D.thesis: 'De financiering van de kathedraalbouw in de middeleeuwen, in het bijzonder van de Dom van Utrecht' (The financing of cathedral construction in the middle ages, particularly of the Utrecht Cathedral), University of Amsterdam, 1981.
Curator of the topographical and historical print collection of the municipal archives at Amsterdam. From 1972 on curator, subsequently director of the Department of Dutch history, Rijksmuseum, Amsterdam.

## 4.5 Reflecting the constitution of the congress paper: Pacific Rim and Basin, Unity or Diversity

Willem Jan van den Bremen

On a cold, rainy *winter*day in August 1988, I came across Hetty Verduin-Muller in an university building in Sydney, Australia. We were both participating in the 26th Congress of the International Geographical Union, but in different sections. We took ample time to talk about the congress, the papers presented and the papers produced by us. It was an exchange of experiences with the preparation, production and presentation of the papers as well as about its scientific contents. In November 1988 she asked me on behalf of a research project and a symposium to be held in May 1989 to reflect upon the constitution of my paper on the 'Pacific Rim' as a product of knowledge and to present the outcome of this process.

Scientific papers are of vital importance to meetings of researchers at congresses, symposia, workshops. They represent the result of research that has just left the forum of discussion within the local research group. In disseminating the findings one is looking for support at a higher and wider level of selection: that of the national and international group of colleagues as 'fellow travellers' in the same field. Most important is the attention of the audience at that meeting of 'understanding' colleagues; a personal talk with one or two of them, the not too average remarks of the convener, the possibility of co-operation and exchange of research products, a chance to be published in the proceedings of the meeting or better in a journal with a high reputation in the world of researchers and a worldwide circulation.
Support and success have partly an objective and rational aspect in the evaluation of the knowledge product - the paper as an adequate description of theory, methodology and results - however, there is also a rather large subjective part with personal elements in it. Talking about research is a social activity, as science itself is a product of culture. Moreover, not all papers are written or presented with the purpose of demonstrating the actual frontier of research of a person and/or group of researchers. And to put it straight away in many cases a written paper is, concerning academic institution, a conditio sine qua non to hand out a ticket for the trip even if it seems to represent no more than some uninteresting subject matter that was available at that moment.

One of my IGU congress papers was on **'The Pacific Rim and Basin: Unity or Diversity?'**, a topic of main interest during the conference. It was produced and presented by me, on my own initiative, not as an invited paper, and as a researcher from without the region. In this paper a method was presented to evaluate statements on regional unity by economic interaction and its application to the so-called Pacific Rim-land countries. The method was not presented earlier. However, the paper was the latest report produced in the framework of a research program on 'the spatial pattern of maritime transport in the global economic system' that had been going on for some five years. So it could be conceived as a science-based, thematic as well as a regional and highly relevant contribution.

The development and construction of the paper 'The Pacific Rim and Basin' as a knowledge product will be described hereafter within the context of the research program mentioned on one hand and with regard to the specific scientific forum of (maritime) transport geographers on the other.

### The paper's institutional context: the IGU working group transportation geography 1980-8, IGU study group/commission maritime geography 1984

During the Tokyo IGU congress in 1980 it was decided by the participants of the working group on transportation geography to continue their cooperation for the next four years and among others pay special attention to common communication and research in the 'new international maritime order' with the 'international division of labour' as a background.

An introductory paper was produced by the then president professor Calogero Muscarà in co-operation with specialists in this field and discussed with other papers in June, 1981 at the first meeting in Naples, Italy. One of the intentions was to divide maritime space into regional parts and to have specialists from all these parts involved in real international co-operation.

In November 1981 there was a second Naples conference. However, from the beginning there was a problem. Researchers are individualists and likely to continue their own (successful) line and way of research. They are co-operative to a certain (reasonable) extent. For that reason papers were produced during the next four years within the field of maritime transportation, but not in a very coherent way, and not with the proposed

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regional division of maritime space and coasts with ports as the main aim. Because there was also a topical or thematic division of the subject matter possible and agreed to there seemed to be no problem. Many interesting research outcomes were communicated in papers and published afterwards in proceedings and international journals.

In 1978 I was invited as a corresponding member of the IGU working group on transportation geography, but I did not accept being busy with other lines of research.
However, by a coincidence I was informed in 1980 by a colleague from the Free University of Berlin who was a participant of the working group, of the intentions of the transportation group mentioned before with respect to maritime transportation. I contacted the chairman reminded him of the earlier invitation to become a corresponding member and indicated that I could participate in the new activities. It was an interesting opportunity, because in the Netherlands there were no geographers specialized in maritime transportation at that time, and regular discussion is needed to proceed in research. My attention did go foremost to the West European continental ports of which 'Rotterdam' is the largest and also the largest in the world, calculated in total tonnage throughput. But, especially later on I was also tempted to study the seaports and maritime shipping in the Western Mediterranean, the southern most coastal region of the European Community and especially to macro-global scale pattern of maritime transportation.

It is very difficult to get comparative statistical data for maritime transportation by seaport or by country not only at the global scale, but also at the scale of smaller sea areas. Not only to compare volume in spatial differentiation, but also in change over time. This problem could be solved for the years from 1969 on by using a very useful UN statistical publication on maritime transport data transformed from trade statistics. This source of course has many limitations, but could be used for a start as the basic data set for my part of the project intended by the working group. The data on transport flows permit a resolution level of the seacoasts of the world and its seaports aggregated into some thirty coastal areas.

From about 1981 this UN data set was used in the Groningen research unit for research experiments at the *macro-scale* level in maritime transport. This part of the Groningen research is for that reason desk-research. Data are available for some seventeen years now, covering two oilcrises (1973; 1979), the economic recession (1982) and the period of economic growth in the second quarter of the 1980s.

In a way comparable with the best traditions of the 'quantitative' revolution in geography data were processed, computer programs written and computer maps produced to get a feeling of the possibilities of the data, to develop and test hypotheses on the spatial pattern of maritime transportation and its change. These data and procedures were also basic to the production of the Australian paper on the 'Pacific Rim and Basin'.

For the sake of completeness I first have to make two remarks on the institutional context of the research program of the working group and the contributions of its participants.

The 'working group' on transportation geography as such ended its existence in 1988 at the Australian IGU congress. But maritime transportation could be included in the new IGU Commission on Marine Geography. At the same congress this commission was promoted from a study group on marine geography and will further the discussion on maritime transportation for the years to come. In the mean time, attention at the Groningen University, Faculty of Spatial Sciences, extended from the macro to the meso level: to coastal ranges of seaports and individual seaports, and the micro level: behavioural approach to decision making with regard to 'choice of a port' as a main topic. This three-level research is included in the Conditionally Financed Research Program (GEOG 1 Regionale Systemen). It is officially embedded in the research structure of the faculty mentioned for some six years now.

Reverting to the most important problem of the scientific forum, I have to state the following experiences. It is sometimes difficult to prove a reproductive process after a presentation of a congresspaper. It is always possible that about the same time more researchers discover the value of a given data source. So more research outcomes from different authors are published afterwards. In a few cases some kind of exchange of internal reports, papers and/or cross-citation and sometimes co-operation is developing. In my case I can trace such a development to Dr J. Charlier (UCL, Louvain-la-Neuve, Belgium) and Professor A.D. Couper (University of Wales, Cardiff, UK; World Maritime University, Malmö, Sweden), who are both active participants in the (new) IGU commission on marine geography. So the institutional context in which research is discussed seems most important for the then reciprocal reproductive process.

### Macro level research in maritime transport

The limits to spatial/regional and topical level of analysis were set by the data base as was stated earlier. Some thirty coastal areas and thirty-seven 'three-digit' commodity groups were available as statistical aggregates.

Representative commodity groups with regard to their transportation requirements - as liquid bulk, dry bulk, general cargo - and their position in the national and global economies - energy, raw materials as ores, food (grains), products of different levels of economic development (refinery products, machinery), had to be selected from these groups. Handbooks on economic development and transportation are very useful in providing this kind of information, but the selection process itself is rather arbitrary. Theories about transportation and economic development were used as a framework for model building, data processing and to start testing procedures.

Of importance were concepts and theories about the development and change of core-periphery relations, the distance-decay principle and the so-called three-factor-explanation of spatial interaction: complementarity, intervening opportunity and transferability (Johnston 1976).

Instruments had to be developed to register the changes over time and space of the spatial patterns of interaction or flows of goods by maritime transport. How could they be measured, if there was a dispersion or a concentration of maritime transportation?

In the meantime a kind of polar network had been presented by Ohmae (1985) in the discussion about the n-polar world economics. He postulated a tripolar world: Europe-Africa, Japan-Rest of Asia, USA-Rest America; each with an incentive to penetrate into each other's core economy and at the same time expanding first into the near peripheries, later into the others and finally covering the global economy.

Other authors emphasized the process of de-industrialization in the core areas and the issue of keeping a larger part of the value-added of the final product in the developing (raw material exporting) countries (Bradbury, 1987; Dicken, 1986). A not too systematically organized set of scientific opinions, models and methods were available as a background for an invitation to further research together with 'reasonable' statements from government and business. Today there are some very adequate summarizing reviews regarding this cluster of problems (see: Kiljunen, 1989).
With regard to methods used, an experience with cross-fertilization has to be mentioned. A method developed by Van der Knaap & Sleegers (1982) on measuring spatial stability in migration flows was applied to our commodity flows with success.
A more or less stable network of concepts and theories was developed, hypotheses were formulated and tested with adapted techniques. Only secondary sources were used. Fieldwork, interviews etc. were only relevant as far as the opinions of experts was required.

A larger internal report - presenting an overview of the global situation - as a kind of atlas with commentary was published in 1986 (Meester & Van den Bremen, 1986). Before this report, three papers were prepared and presented at conferences of the working group on transportation geography, respectively in Naples, Italy (1981) (Van den Bremen 1981; 1982), Bruges, Belgium (1983) and Rome, Italy (1984) (Van den Bremen 1984a, 1984b, 1986). This last paper was revised to an article and published in a special issue on the Geography of Transport of 'GeoJournal'.

After the IGU conference in Paris, France (1984) a further two publications were produced. One was originally produced as a congress paper on the maritime situation in The Western Mediterranean, a kind of subcore area (semiperiphery if we follow Braudel) of Western Europe. This one was inserted in the proceedings of the working group session in Leon, Spain (Van den Bremen 1986). The other one was written as a chapter in a book (Van den Bremen 1987) and described the changing position of the Westcoast of South America, a part of the so-called Pacific Rim and Basin. This was also the first try out of the methods developed so far, on the southeastern part of the Pacific Rim.

This was the situation when the paper for the Australian IGU congress (Van den Bremen 1988) had to be prepared. There were enough data and there was enough knowledge about the Pacific Oceans maritime transportation pattern to produce a reasoned statement on unity and diversity and do the real testing of this statement. It was known that the Westcoast of South America and Central America were unimportant. From some excercises with the data a rather stable relation between Japan or Far East Asia with South East Asia and South Pacific Coast (California) of the USA was apparent.

However, the reasoned statement was included in the abstract of the paper that had to be send to the congressorganizers too early to have finished the testing. The results of the testing were included in the paper itself and were happily not in disagreement with the contents of the abstract paper.

### Macroscopic geographical research: a paper on functional economic integration within the so-called Pacific Rim and Basin

An important task of the geographer is to make the world intelligible. This goal can among other things be attained if 'areal differentiation' - an axiomatic statement in this discipline - can be made plausible. Areal differentiation and division of industrial labour together can be proven by an adequate scientific description of the intrinsic qualities of the component regions (so-called coastal regions) ànd the interaction and coherence of those regions. This more or less systemic special structure is changing through time as a whole and in parts. Under the perspective of the human scale Kondratieff-cycles are more relevant than those of the abiotic world to explain change over time. Important categories of determinants of geographical situations are economic, social and political.

It should be clear now that, with all the necessary knowledge such as data, concepts, theories and methods at hand, the paper could be produced along scientific principles. Moreover, the product could be done in reasonable time.

### The actual presentation of the paper

One of the main problems of presenting a paper is the short and mostly uncertain time span you get to communicate the information. From the beginning you have to keep in mind this aspect. It means that in an early stage you have to think about the possibility of visual aids in the presentation: schemes, models, tables. One of the powerful visual aids of the geographer is the map.

During the presentation maps were used next to tables overviewing the interconnected economies in the Pacific Rim through the years 1972, 1977 en 1982. Thus changes in the spatial interaction became clear.

A basemap centred on the Pacific Basin was produced with the help of our cartographic colleagues in Utrecht Univeristy. A computer program made it possible to produce an endless number of intelligible maps, for the sake of the paper. Some of them were also used on overhead projector transparencies in the presentation.

Because of shortage of time the presentation had to be rather condensed. The paper itself was selectively distributed to the parpticipants of the session asking for a collegial comment and hoping for follow up in the near future.

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Teacher of geography in secondary schools at Rotterdam, 1959-1963. Lecturer in economic and human geography at the Netherlands' School of Economics (now Erasmus University Rotterdam), 1963-1967. From 1978 full professor of economic and human geography at Groningen University. For many years, 1961-1971, he was executive editor in chief of the Journal of Economic and Social Geography (TESG).

# 5 THE SOURCES EXPLORED, PROCEDURE AND FINDINGS

## 5.1 Introduction and context

Surveying the process descriptions it strikes me that the authors must have derived creative pleasure from their activity. The chosen description titles speak well for the author's involvement. The writing demonstrates in a pleasant manner the skilfulness and engagement of the author.

Looking back, this is not surprising because during the construction process of a qualitity knowledge product there must have been some deep thinking, considering and much comtemplation. Such a penetration in the development process stimulates the mind and leaves there something of value which does not fade quickly.

All four authors mentioned the fact that the execution of the task was not easy, but after getting used to it they worked with a will.

From the process descriptions it appears that the authors have given a very careful account of the construction of their knowledge product. It was in the nature of the research that the development descriptions should differ strongly from one another.

Studying the process descriptions I sometimes felt the need for futher information, so I contacted the authors personally. These talks were restricted to inquiries and were intended to clarify remarks in the descriptions. The descriptions themselves did not undergo any adjustments in spite of the personal contacts.

## 5.2 Source procedure

In the project under consideration descriptions of the four selected knowledge products were analysed, thus it was the final product which was researched with a view to finding out how it was arrived at.

The procedure followed in analyzing the source-material was determined by the aim of the research. The aim being defined as the acquisition of insight into the method of constructing (in the sense of development and design) of geographical knowledge products.

The essence of the analyzing and classifying activities though, were focused on those factors which could have led to a positive result for each of the knowledge products. When analyzing the descriptions, the four rules of thumb, acquired from the research described in part II, functioned as an instrument.

As became clear from the research (part II) the point was, when constructing a knowledge product, not just to follow the bare elements of the conceptual model in a step-by-step process, apparently leading to a good knowledge product, as well as holding on fundamental aspects of the development process in its totality.

But as applied research with the model had proved, the model was not fully effective when used in constructing knowledge products. This was not because the model was wrong but because the model as an abstraction never fully could cover the construction process in reality. The model, in itself, was very helpful as an introduction to the construction process. Therefore rules of thumb, four all together, were formulated, originating with the actual use of the model in relation to the experienced bottlenecks. The rules of thumb read as follows:

1. Programme of requirements for the geographical knowledge product under consideration; typifying output etc.;
2. Researching the expertise available and primary and secondary sources;
3. Conceptualizing and structuring the content (gradations of the structuring process); expression into word and visual image (manuscript/scenario type);
4. Realizing the manuscript/scenario, putting it into a medium or media.

As the rules of thumb correspond with the essential features of the model, they could in fact be analysed as concepts, but were introduced as rules of thumb because of the practical nature of the project.

[In the third rule of thumb are concentrated two closely related concepts of the model. This has been done on account of experience with the model.]

As was broadly argued in the section entitled 'The authors invited to write the process descriptions' (section 3.2), the authors were given the rules of thumb before setting to work.

As far as can be concluded from the descriptions, the rules of thumb did not have a fundamental influence on content or form. In a final paragraph two of the authors briefly mentioned, without much comment the rules of thumb and the authors of the description of the exhibition could, to a high degree, insert the rules of thumb headings for each section of their working progamme as it developed over the years (see figure 2, p. 79).

The author's essays are really free descriptions reporting the construction process as experienced. But of course putting flow-events on paper needs instantaneous decisions.

Here a rounded process was approached and illuminated in its constructional features, which is rather unusal. To unravel from the descriptions, the profile of the framework and its constituent assumptions, in the sense of the rules of thumb, would not be an easy task. Nevertheless this is most important in order to understand, as precisely as possible, the origin of the quality of the selected knowledge products.

### 5.3 Source findings

Preceding the discussion of the findings on the sources, a mainly framework based summary of each of the descriptions will be given. This is to avoid constant interruptions of the text caused by the intercalation of excerpts from the descriptions.

I hope thus to keep the text readable and think the procedure is permissible because the full and rich sources are given in the preceding section of this research report.

**Summaries of the descriptions (framework-based)**

* The GLOBAL GEOGRAPHY PROJECT was developed within the Agency for Instructional Technology, Bloomington, IN., an organisation specialized in making non-print knowledge products. AIT has a knowledgeable permanent staff and nearby cooperation with each project is available from people in related fields.

The construction of the project shows a high degree of efficiency and is a good example of output-financing.

The design team of the project worked closely together with a specialist group of geographers and social scientists and to maintain contact with the users a consortium was formed. The local consultants, located all over the world, can be considered as experts on the spot, but their way of acting was in strict cooperation with the design team. From the consultant's report, in case the Netherlands, it became clear that the task was experienced as a very demanding one. The geographer Backler, chief project consultant functioned within the design team as a knowledge engineer.

The project got its full media realization within AIT. After consulting with the local consultants, the specialist group and the consortium, the design team decided on the definitive version of the print material that supported the visual output in an informational and educational sense.

The video shots were taken by audiovisual services, mostly local or regional, under the personal supervision of the producer and member of the design team. The raw video shots were processed and mounted with other visual material (such as documentary film, and slides and maps) according to a careful 'design grammar' at the AIT studio in Bloomington.

Clearly the drafting of the Teacher's Guide was undertaken as though it was a knowledge product, but of course as to its practical use related to the video programmes.

The total composition and workmanship were in the design team's hand.

* The development of PEOPLE AND ENVIRONMENT had a course not unusual for a textbook in the Eighties. On the other hand, the textbook itself has rather unusual features in an informational and users oriented sense. The subtitle 'Issues and Enquiries' must be understood as providing a framework for the user.

The publisher as originator asked Slater, on the basis of former publications, to edit a geography textbook focused on current developments in society (the so-called 16-19 curriculum).

In consultation with the publisher Slater invited discipline experts familiar to her to write about crucial themes and regions. She herself coached the potential educational use by inserting a variety of learning activities of a particular type.

The learning activities concerned also many exercises in interpretation of public information-based texts (newspapers, magazine articles, pamphlets etc.) in the light of the subject content as given in the chapters.

The placement of the activities was done, in consultation with the chapter authors, at a relevant place within the chapter.

The manuscript for the textbook therefore became a fine mesh of subject content and learning activities. In the process description the choice for just that structure is elucidated with striking conviction. It is possible to understand this from Slater's Ph.D.research together with her job conception.

When in the hands of the publisher, the manuscript caused, much to the displeasure of the editor, disagreement concerning the content and the learning activities about nuclear energy. Things were eventually resolved.
The media realization was done with the procedures proper to a well known publisher.

* The exhibition WHALING IN THE GOLDEN AGE OF THE NETHERLANDS was, on the basis of the findings of empirical research in the Spitsbergen archipelago (Northern Arctic regions), prepared by a group of 12 specialists. Three of them formed an executive group to coordinate their work.
It was a most favourable circumstance that the Department Netherlands History of the Rijksmuseum, Amsterdam, for a number of reasons (a.o. exploring the Dutch overwintering of 1596/1597 in Novaya Zemlya) showed a high interest in the outcome of the arctic research. The findings concerning Spitsbergen were found sufficiently inspiring that a middle sized exhibition was thought to be justified.
The manuscript for the exhibition was achieved in four phases, rightly called scenarios. After the initiating idea, also in scenario form, followed a preliminary, an interim and a definitive scenario. The definitive scenario was settled on only after the basis of a detailed exhibition plan had been examined.
The exhibition itself was realized by the authorized services of the Rijksmuseum, after consultation with specialists for details.
The objects originating from the 17th and 18th century and were very diverse. Together with documents, travel reports, maps, paintings, drawings, utensils, the whalers' personal belongings (recently found by Hacquebord) were on display, such as cloth, shoes, socks, woollen caps, and smokers clay pipes.
Models were shown of a whale, of the facades of two houses, and of an oven, all at their full size. As a setting for the whaling business, a multi screen show introduced the landscape of arctic Spitsbergen in its constantly changing day light.
All objects and models were thematically grouped in such a manner that story type unities of a loose character were formed.
The executive committee of three remained in function also during the realisation of the exhibition.

* The development of the congress paper PACIFIC RIM AND BASIN, UNITY OR DIVERSITY, seems to be a one-person business. The necessary activities shade off into one another seamlessly.
On the basis of source studies, included former research, the author-researcher determined the potential content and designed the form of his paper and speech along discipline-based structures. A network of discipline oriented relations underlies all the activities, and is rightly and carefully described by van den Bremen.
The media realization of the congress paper was done by the Faculty of Spatial Siences at Groningen University and by the Faculty of Geographical Sciences at Utrecht University. Text, printing and the making of overhead sheets for the presentation were done in Groningen. The basic map of the Pacific Rim and Basin, for the representation of the data, was designed and realized by the Cartographic Laboratory of the Faculty in Utrecht.

In a conscientiously constructed paper and speech the congress participant is informed about fundamental changes in the Pacific macro region.

So far the summaries of the sources, the process descriptions.
Insight into the findings from the sources and their discussion will follow through the use of the analyzing instrument, namely, the rules of thumb.
First the rule will be mentioned and comtemplated in relation to the findings in the sources, however with a view in mind as acquired from the conceptual model. Then the ideas and incentives as gained from the sources are considered in more detail.

**The first rule of thumb, a programme of requirements** is for the purpose of constructional activities, always fundamental. In the case of knowledge products it is often difficult to describe precisely the final appearance as to content and form. A knowledge product gradually grows, so to speak, to maturity only when in a development process or in terms of this research project when 'under construction'. Why then is a programme of requirements so important also in the case of developing knowledge products?
First of all constructing knowledge products is a mental activity with all the inherent doubts and switches, the process needs to be kept to a certain extent under control irrespective of the number of people participating. A view of the final product simply is a must.
Further, such a view is of great value to the different members of the staff and to the organization promoting the project and supplying the money (especially in the case of so-called output-financing). The staff group might be large or small, the members can only meaningfully discuss and make their specific contribution on the basis of reports; those reports need to be written, short and pithy. Verbal messages easily tend to get lost for all kind of reasons.

In the sources a clear account was found about the existence of a programme of requirements, although this 'rule of thumb' was not registered within the context of the full process description. It was obvious that all authors worked firmly along lines agreed between the participants and already set, at the start of the projects covering the knowledge products, but a high degree of flexibility was kept during the constructional process. This way of acting presupposes next to discipline expertise, in particular how to handle the discipline knowledge.
Of course there were differences. They obviously depended on the organizational constraints upon the development of the knowledge products.
That a programme of requirements was in essence present and was kept, could be deducted from the report- and document-based course of the construction processes as given in the descriptions of the GLOBAL GEOGRAPHY PROJECT, WHALING IN THE GOLDEN AGE OF THE NETHERLANDS and PACIFIC RIM AND BASIN, UNITY OR DIVERSITY.
As far as PEOPLE AND ENVIRONMENT is concerned an agreement in the sense of a programme of requirement was set in personal contacts (nearly no correspondence). At a fixed date the expert-authors of the chapters delivered their writings to the editing author.

It was found that consciously operating a, though not explicitly mentioned, programme of requirements (with all room for original and creative input during the development) is a nescessity for a knowledge product of high quality.
Therefore a programme of requirements should be clearly identified as a basic element in a development process aiming at the construction of a geographical knowledge product.

**The second rule of thumb concerns expertise.** An author's expertise concerning the subject is of eminent importance. Only with this expertise can the data and information on the subject be sufficiently understood and a proper appraisal be undertaken, in order to construct the knowledge product.

It could, therefore, in the case of the four quality knowledge products, be understood from the process descriptions that the expertise if not present, was searched for in primary and secondary sources. Often expert colleagues were consulted.
Regarding the search for expertise, the sources displayed variable and colourful procedures. Clearly the authors were used to consulting sources; further, they had at their disposal, a wide and qualitatively high network of relationships within their own and related disciplines. The feeling of responsibility for the final product was evident, mutual friendships, also worldwide, became once again effective.
The need for expertise though and further specialism sprang from the process descriptions. This is a feature to emphasize, because expertise is still often seen as something to collect 'en passant', in other words, just along the road to the final product.

**The third rule of thumb covers conceptualising and structuring the content together with its expression into word and visual image.** (The reader is reminded that the clarity of conceptualization as represented in the geographical knowledge product was the criterion for its selection.)
The third rule of thumb is a rather complicated one. Here an appeal is made to different disciplinary activities, namely

- disciplinary expertise, and further specialism
- handling of the discipline and
- making accessible the chosen disciplinary aspects.

All three activities need to be in the hands of discipline educated persons, because knowing the discipline is a basic condition for: choosing the concepts, configuring the concepts into the content-to-be created, arranging and interrelating the information in an optimally structured content as well as expressing the content clearly in words and visual images. (As far as the media are concerned they will have a place in the fourth rule of thumb.)

From the sources it was clear how intensely and precisely the authors dedicated themselves to fulfil these typical disciplinary and informative work. To carry out these crucial parts of the construction of the knowledge products the authors worked with other geographers or specialists of neighbouring sciences.

The authors made an intelligent use of their network of friendly colleagues, not only as far as the expertise, as such, is concerned, but also for effective participation in the constructing activities. In the case with WHALING IN THE GOLDEN AGE OF THE NETHERLANDS the cooperation clearly was at a national scale, whereas with the GLOBAL GEOGRAPHY PROJECT, PEOPLE AND ENVIRONMENT and PACIFIC RIM AND BASIN the joint operation was international. The authors frankly shared the activities, but always kept a pivotal function, and yet accepted inherently the final responsibility, and rightly so, because the construction process must go on.

The conceptual clarity of the knowledge product is anchored in a manuscript or scenario. The coming into existence of each of the manuscripts/scenarios for the geographical knowledge products in question, is essentially different. Nevertheless this can be easily followed in the process descriptions, as well as in the summaries. It is emphasized that in the knowledge products in question the manuscripts/scenarios were designed and written by discipline experts or, as in the case of the GLOBAL GEOGRAPHY PROJECT, by a professional scenario/script writer under supervision and responsibility of a discipline expert.

**The fourth rule of thumb concerns the realization of the manuscript/scenario viz. putting it into a medium or media.**

In order to give access to the conceptualized and scripted content a medium is a necessary. These can be print media, non-print media, or a combination of both. (With that classification the varied and long list of media is divided in two handy categories).

The technical aspects of the media realization will not get attention in this section; the focus will be on the explanation of ideas and expectations concerning media design as has become obvious from the process descriptions.

As we have seen it is the discipline expert, in his capacity as a knowledge engineer, who composes and writes the manuscript or scenario. This is done in words together with the necessary visual images, mostly as graphs, maps, diagrammatic schemes, sketches and photographs. If not present they are precisely described as to content and form. The structure of the manuscript/scenario as well as the sections and its expression are principally discipline based.

The medium expert now has to give the manuscript/scenario a form which enables it to undergo a transformation in order to fit the related medium. The construction process enters its last phase.

This 'fitting-in' and the resulting 'interpretation' can be the cause of many disputes between the manuscript/scenario writer and the medium expert. Often the differences lead to substantial controversy. And no wonder, the medium expert, here as an ancillary scientist, has to do with a semi product, still a product in-the-making by an expert of a different discipline. The wider the distance between the manuscript/scenario and the medium, as is the case with the non-print media, the larger often are the realization problems. Especially is this the case when media suggesting movement, such as films and TV/video, are concerned.

In conclusion it is posited that, considering its function, the medium is a natural part of the knowledge product to construct.

The very nature of the medium concerned could be pursued in the process descriptions. From the very beginning media-thinking, so to speak, formed part of the development discussions. But only after the initial and conceptual work is done by the discipline experts could the media experts become active. However, the discipline experts undeniably remained present during the media realization and rightly so because the discipline-based conception should not get snowed under by the media form. A well-considered cooperation between discipline people and media experts is therefore of primordial importance.

It was quite clear from the descriptions that throughout all the phases of the construction processes this has been the case. It can moreover be claimed that the full acceptance of each other's expertise must have been one of the main reasons for the high quality of the researched geographical knowledge products.

### Beyond the rules of thumb

It is argued that the descriptions offered a wealth of relevant information. This information was sought out and interpreted and denominated under the discerned rules of thumb.

But the process descriptions conveyed often 'between the lines' information not so easy to hold on by the way of the rules of thumb. And yet this information, refering to the capacity and the mentality of the author, is of fundamental importance. Wrongly the personal aspects are often taken for granted.

From the sources then it became obvious that the most important factors for a good knowledge product, apart from the control of methodology features, as manifested through the rules of thumb, seemed to be the development environment of the knowledge product as well as the way that environment is organized; the personality of the author together with his/her attitude towards the discipline, towards education and public information; the nature of the medium to be used and perhaps above all the 'little creativity'.

[The nice and pregnant term 'little creativity' is borrowed from a speech of Peter Schellenberg, director of Swiss Radio and Television. 'Kriterien und Methoden der Programmentwicklung eines öffentlichen Senders. Auslegung des Programmauftrags.' (Criteria and Methods for Programm Development of a Public Broadcasting Station. Explanation of a Program Mandate.) Symposium, 'Televisionen: Ausblicke auf zukünftige Fernsehprogramme' (Televisions: Prospects for future television programmes), Rüschlikon/Zürich, 20/21. November 1989.

The symposium was organized by the Gottlieb Duttweiler Institut für wirtschaftliche und Soziale Studien, Rüschlikon/Zürich.]

# 6 CONCLUSIONS AND PERSPECTIVES FOR FURTHER RESEARCH

## 6.1 Conclusions

In reviewing and considering the findings it seems appropriate to distinguish two main categories.

- The first category concerns the framework with its supporting elements, the rules of thumb;
- The second applies to the expertise of the people doing the job, the constructors.

**Concerning the framework/the rules of thumb**

From the analyses of the process descriptions (see for the process descriptions section 4 and for the exploration of the process descriptions section 5) it became clear that, from the construction process of all four geography knowledge products, could be derived a highly systematic approach. Obviously the systematization of the approach was principally determined by the author's knowledge of the discipline, and gained throughout the construction process.

But as was demonstrated in the findings, the sources permitted clear indications from which were derived the four discerned rules as a constructional framework. In other words the organizational work for the four high quality knowledge products was done implicitly along the lines as constituted in the four rules of thumb. Therefore further study of the rules of thumb as a function of the actual construction process seems scientifically attractive.

In denominating the source-based information, as worked out in the findings, it became clear that, in a broad sense, the rules of thumb tend to reinforce each other. The notion of this mutual support is of great importance because the infrastructure of the constructional framework has, as a result, considerably gained in firmness. When matching, the four basic rules of thumb include up to ten combinations. And of course, not all combinations will be equally profitable.

Nevertheless it is argued that a system's multi-dimensional use of the rules, as suggested, is far more relevant than at first sight. This is because the field of thinking, when constructing knowledge products, is wide and attractive, at the same time so full of pitfalls and side issues, that every thing should be done to keep procedures under control. It is greatly emphasized that practising the mutual support vision by no means implies the fencing in of creative thinking, on the contrary after defining 'the room for manoeuvre' the constructor and the staff might come to a thorough exploitation of the constructing possibilities.

Today most knowledge products are the subject of output-financing. It is argued that a thoroughly considered and carefully written out exposition of the methodology of the construction process of the geographical knowledge product in question, will undoubtedly satisfy the financing partner. The foundation for such an exposition is provided by the framework and its internal firmness in relation to the type of knowledge product in question. Thanks to the use of the rules of thumb as a methodological instrument, there is no need whatever to expose prematurely original ideas and solutions.

*Summarizing* it can be said that, from the process descriptions of the knowledge products under consideration, the four rules of thumb, as formulated on the basis of the conceptual model and its use, could be discerned. It was clear that they formed, implicitly, the frame work for the knowledge product's construction process and that a functional combination of the four rules throughout the construction process will firm up the frame work.

**Concerning the expertise of the author as a constructor**
As recorded in the findings, the expertise of the authors in a broad sense could be noticed. But on reflection it was felt that the expertise demonstrated itself throughout the research project.
Apart from the researcher's choice of the geographical knowledge product, made on the basis of its conceptual quality (see section 3.1), the author's reaction to the request to write the process description showed an implicit expertise in that the reaction was discreet, indicating insight into the subtlety of the task (see section 3.2). The process descriptions itself offered an ample opportunity to ascertain a constructional expertise at large (see section 4).
As might be clear from the analyses as executed in section 5, the expertise in its different aspects of knowledge and skills seemed nearly self-evident, but no doubt was acquired on the basis of thorough study and years of long experience. In this respect the age of the authors as given in the curriculum vitae data in relation to their academic education and career speak for themselves (see section 4).
This is not the place to discourse on the ability to practise knowledge engineering as manifested by the work of the authors of the knowledge products examined, but *summarizing* the findings it can be said that the author's expertise in the sense of knowledge and skills also clearly needs to include career experience, a broad mind, management qualities and personal maturity.

## 6.2 Perspectives for further research

Referring to the conclusions I would recommend the widening and deepening of the study of the **rules of thumb**, separately as well as in combinations. Constructors of knowledge products working in the field just need handy tools, in this case the rules of thumb. The necessary source material for such a continuing practical study can be obtained in two ways.
*First*: by analyzing processes with the help of the rules of thumb on all types of documents, of the construction of knowledge products appreciated for their high quality and
*Second*: by the painstaking controlled construction of knwoledge products along the lines set out by the rules and in relation to the model.

But the reader will remember that the four rules of thumb, as given, were directly related to the conceptual model. Consequently the rules of thumb could be by their very nature characterized as **concepts**.
Since the rules of thumb, as concepts, could be so manifestly discerned from the process descriptions, the results may be rightly fed back to the model as such. The

feed back particularly concerns the model's concepts. Therefore a deepened understanding of the essentials of each of the concepts is obtained.

This can be done by studying related literature with an eye on the concept's corresponding function within the model. Afterall each of the four distinguished concepts can be related to existing disciplines or sub-disciplines, so in principle the search for literature will no doubt produce results.

For over the years, literature concerning cognitive aspects of design and construction procedures, has appeared. It is true that this literature is very specialized, and relates to, for instance industry, architecture, art, filmwriting, museology, communication, and education. However, with the findings of the project in mind, the study of the type of literature mentioned, is recommended in order to see what aspects could be of use to deepen the knowledge of the model's concepts.

Moreover it is strongly advisable that further research on theory and method in relation to the construction of geographical knowledge products should focus firmly on the study of problems of recent developments in the construction of information systems.

The excitement about the tools and their initial use in relation to automation, including data-collection and programming issues, has passed its peak, but unfortunately - as so often - the aims have not been achieved to the extent expected. Consequently, attention is now clearly shifting to the basic problems of planning and conceptualisation of information and to the way experts achieve their aims (the study of expert systems). Therefore it might be most worthwhile to observe developments in that branch of information technology.

In this respect, the present developments in relation to information systems reminds me of that which took place in the media field. There too, in general, attention focused for quite a time primarily on the tools, the content in the form of manuscripts, programmes etc. being regarded rather of secondary importance: the tool worked and that was it. But in the course of time, for complex reasons, things changed and concern focussed primarily on the content + its expression - and rightly so.

And last but not least, a high dedication to the type of research concerned seems a necessity. And of course always involvement is a first condition for a researcher, nevertheless it is mentioned here explicitly because as experience has shown, the degree of difficulty of this type of research is so often undervalued.

# 7 REFLECTING ON THE SYMPOSIUM OF MAY 1989

## Introduction and context

The reader might remember that at the end of section 2 on the 'How' of the research project I referred to a symposium about the ideas elaborated in the research project, in which the authors had the opportunity to talk about their experience of the construction processes. This one-day symposium 'Exploring the construction of geographical knowledge products' was held on May 26, 1989 in Utrecht.

The aim of the symposium was to bring together the authors of the selected geographical knowledge products with other workers in the field of knowledge products. The respective authors were to talk about the experienced construction process as described.

It was hoped that the authors would, via their introductory speeches, invite the participants, to share their experiences and by that both parties would gain. It might be good to mention once again that the process descriptions, as published in section 4, were handed in by April 1989, thus in ample time before the symposium. Consequently, the symposium discussions could not affect the descriptions.

The symposium was advertized by a folder which contained the program next to information about the essential features of the what, why and how of the research project in general. The symposium folder was disseminated to potentially participating individuals and institutions.

The number of participants who enrolled was limited, fewer than expected. This however did not pose a problem, because the number of participants was to be kept small anyway for reasons of mutual contacts. In the event, the group consisted of 20 persons (including the authors, being participating discussants at their colleagues performances).

Ample time was reserved for formal and informal discussions.

The speeches as well as the formal discussions were recorded on audio-tape.

The reader will find the participants' names together with their fields of activity in an addendum. It might be clear from the list that the media field was diversely represented. Further it must be said that 9 participants (not counting the authors) had graduated in geography.

## The course of the symposium

The atmosphere of the symposium was pleasant and relaxed, the participants showed much interest. The positive ambience, no doubt, had also to do with the location of the symposium in the Utrecht Congress Centre being well established and managed.

The symposium was opened by Prof. Dr. M. de Smidt of the Faculty of Geographical Sciences, Utrecht University, with a short address about the aspects of the social and economic importance of information technology.

Each of the authors talked, functionally supported by images (visual and audiovisual), for about 25 minutes about the experienced construction process of their geographical knowledge product. In doing so they introduced at the same time the knowledge product as such, as was done so harmoniously in the process descriptions.

The participants had at their disposal a file containing background information and relevant fragments of the knowledge products under consideration. But it was evident that during the symposium's discussion the time available was too short to profit fully from the file material.

Each of the presentations was followed by a discussion which, (on my request) was opened up by one of the participants working in the related media field. Thus concerning the 'Global Geography Project', this was done by René Swetter, Lecturer, Department of Film and Television of the Amsterdam School of Arts, and with regards to the textbook 'People and Environments' by Drs. Dries van Ingen, author/editor of geography schoolbooks of the Publishing House Meulenhoff Educatief, Amsterdam, whereas the exhibition 'Whaling Trade in the Golden Age of the Netherlands' received its first reaction by Drs. Arja van Veldhuizen, staff member of the Amsterdam Historic Museum and the Tropical Museum, Amsterdam and lecturer in Communication through educational and public information exhibits at Nijmegen University. A first step in the discussion on the 'Pacific Rim and Basin', a congress paper, was taken by myself.

What were the essential reactions to the process presentations as experienced and given by the authors?

Summarizing, it can be said that the discussions with the respective speakers concentrated in particular on further information about media design and on the procedures followed when materialising the knowledge products in question. In another words 'how things were precisely done'. The content as such was not questioned, the author's expertise being a matter of fact.

Specialisation in a certain medium seems to bring a coherence in thinking and indeed participating media specialists obviously argued from a same background. Other participants stood aside. Of course this may not surprise but it was striking to observe this phenomenon so clearly. This observation could be made thanks to the size and the variation in the media specialisation of the group of participants.

Seen in a media-based context the video-program (Global Geography), the textbook (People and Environments) and the exhibition (Whaling Trade in the Golden Age of the Netherlands) received the most attention.

In a final session of the conference all participants, one by one, were asked to comment upon the experiences of the symposium.

In general the reactions were rather positive, it was felt that the participation had been worthwhile and the experience useful for daily work. Listening carefully to the reactions and the phrases, words and expressions used, I found the comments were sincere, not just for the sake of courtesy. But, reading between the lines, I got the impression that still it was difficult for some of the participants to see an educational or public information program, a textbook, etc. as a knowledge product with all its constructional features.

When saying good bye several participants explicitly mentioned the informal contacts, including the interchange of addresses, they had obtained during the symposium.

**Conclusions and Recommendations**

Evaluating the symposium it can be said that the authors of the selected knowledge products and the other participants as well as the participants among themselves really exchanged ideas during the formal and informal discussions. And such contacts as is well known do pay, more in the long than in the short run.

The phenomenon of methods concerning the construction of knowledge products as such was a point of view worthwhile considering. This can specially be understood from the formal discussions in so far that the media designing and the procedures to follow were felt crucial by the participants and therefore got much attention.

In conclusion it can be said that there clearly seems to be a need for a book of ideas and views about the possible use of media as a means of expression of content. Content and medium simply cannot exist without one another. The realisation of manuscripts and all types of scenarios of knowledge products have common grounds, leaving nevertheless all the room for creativity. What I mean, though, is a kind of media grammar, a manual of an instructional character and not a collection of stories about a certain medium; such books are already available.

Further it is to be recommended that discipline experts together with media experts set up workshops, where the construction of geographical knowledge products can be studied and practised in the context of theory and methods.

Such workshops need to be organized in the near future. It will take a long time before professionalism, as pursued by the responsible institutions, becomes a reality, and at the same time society is in need for geographical knowledge products of high quality.

**Symposium**

Exploring the construction of geographical knowledge products
May 26th 1989, Jaarbeurs Congress Centre, Utrecht

Participants

| | | |
|---|---|---|
| J. van den Boogerd | Project co-ordinator | Foundation TELEAC, Utrecht |
| P.H.J. v.d. Boorn | Ed. Editor | Royal Tropical Institute, Amsterdam |
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| Mrs. M.E.J. van Dop | Projectmanager | Foundation Film & Science, Utrecht |
| R. Gerner | Geography Teacher | Hilversum |
| L. Hacquebord | Director | Arctic Centre, University, Groningen |
| E.A. van Ingen | Author/Editor | Meulenhoff Ed. Amsterdam |
| A. Jansen | Author | Meulenhoff EDinfo, Emmen |
| H.M. Leyten | Curator | Tropical Museum, Amsterdam; Lecturer Museology, University of Amsterdam |

|  |  |  |
|---|---|---|
| H. Meijer | Director | IDG, Geographical Institute University, Utrecht |
| J. Nelson (sub. A.L. Backler) | Manager for international services | Agency for Instructional Technology, Bloomington, IN. USA |
| J. Noltes | Geography Teacher<br>Part-time staff | Amstelveen<br>Geographical Institute University, Utrecht |
| Mrs. M.A. Ott | Staff | Design Deparment Meulenhoff Ed. Amsterdam |
| H.J. van Schalkwijk | Director | Foundation TELEAC, Utrecht |
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| R. Swetter | Lecturer | Dep. Film and Television, Amsterdam School of Arts |
| R.G.F.M. v.d. Vaart | Staff | Geography for Education, Faculty Geographical Sciences University, Utrecht |
| W. Veen | Lecturer | Dep. Geogr. Teacher Training, University, Utrecht |
| A. van Veldhuizen | Staff | Historical Museum/Tropical Museum, Amsterdam. Lecturer Exhibition Communication, University, Nijmegen |
| Mrs. H.S. Verduin-Muller (chair) | Prof. em. | Faculty Geographical Sciences University, Utrecht |

## Epilogue

As argued in the foregoing pages geographical knowledge products of high quality should be made available. Consequently, the construction of geographical knowledge products needs professionalism; no longer can it be just a spare-time activity and neither will it be an easy one. Writing these lines I am reminded of people who think Mondrian paintings are just a question of using a ruler and primary colours . . . A classic example of easy thinking.

The hope that a growing concern might be shown for the quality of knowledge products, was expressed, perhaps most directly, in sections 1 and 2 of part II of this publication. Indeed in the last few years, society's interest in the quality of knowledge products has grown significantly. The appreciation of quality seems to be coupled to forms of professionalism.

The world of knowledge as well as that of the media became, each from their specific side, involved in the quality aspects.
The disciplines are for all kinds of reasons, willing to communicate the output of their activities, often stimulated by demands from society, such as education and public information. And the media in their turn have at their disposal a wide supply of dissemination possibilities. Essentially it is a question of matching the demand for knowledge products with the supply of these in a methodological acceptable manner.
There are hopeful developments to report. Only a few can be mentioned. To begin with we think of different forms of investigative journalism, as manifested in the world's quality papers. Further the involvement of publishing houses in producing specialist and quality books, is demonstrated in well designed bookshops, some of which enjoy a certain fame. Next is mentioned the extension and growing professionalism of museums, so greatly stimulated by UNESCO internationally. The worldwide dissemination of radio and television programmes by short wave and by satellites invites constructors to search for quality. As far as Europe is concerned this is much promoted by the Council of Europe (Strasbourg) and by the European Broacasting Union (Geneva).
Considering these obvious developments it is not surprising that universities, colleges, schools and institutions should look for ways of meeting, through education and training, the professionalism expected from their graduates. May this lead in the near future, to the continuation and extension of research on knowledge products.

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